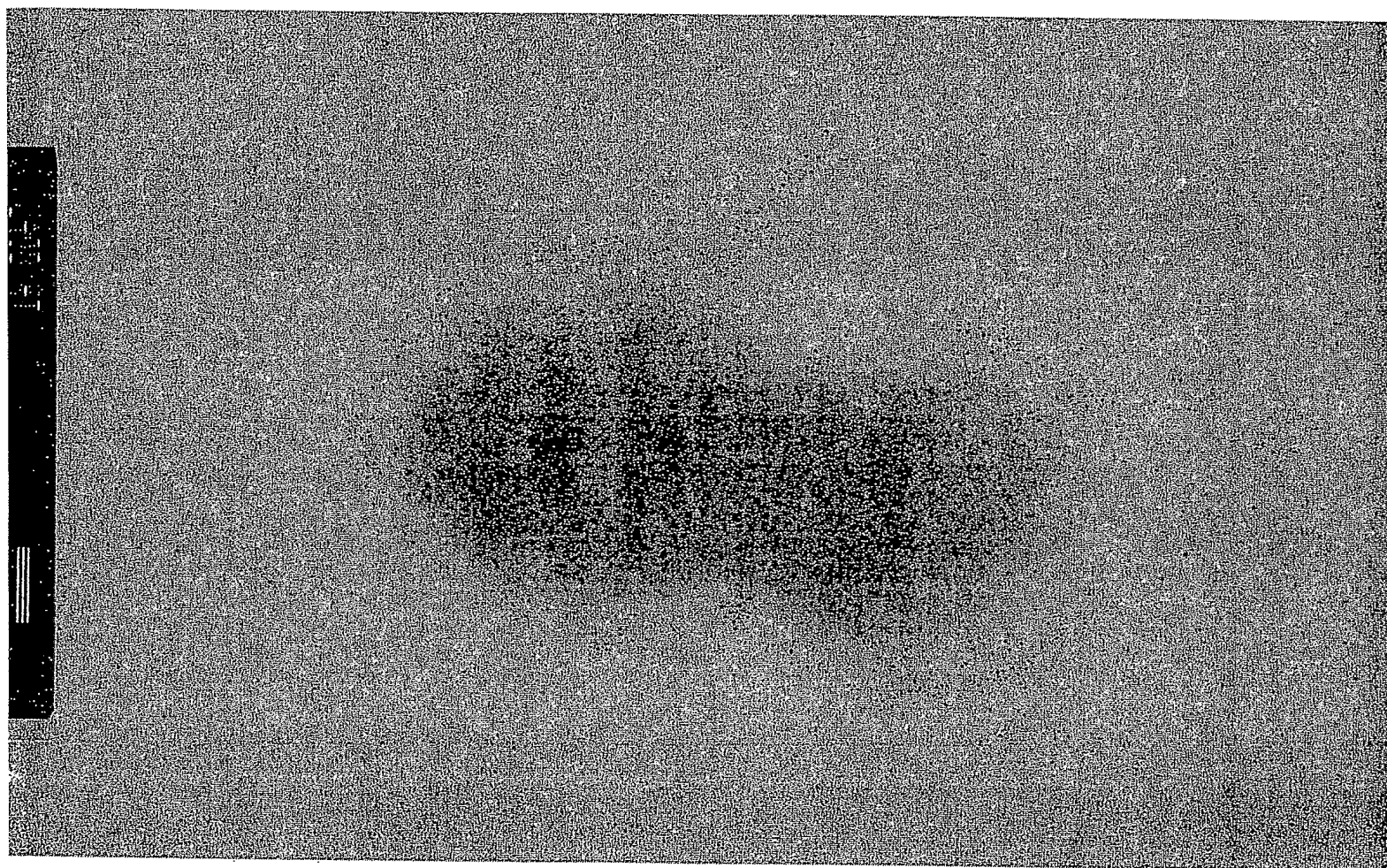


Figure 130



PCT/US05/27239 322/487

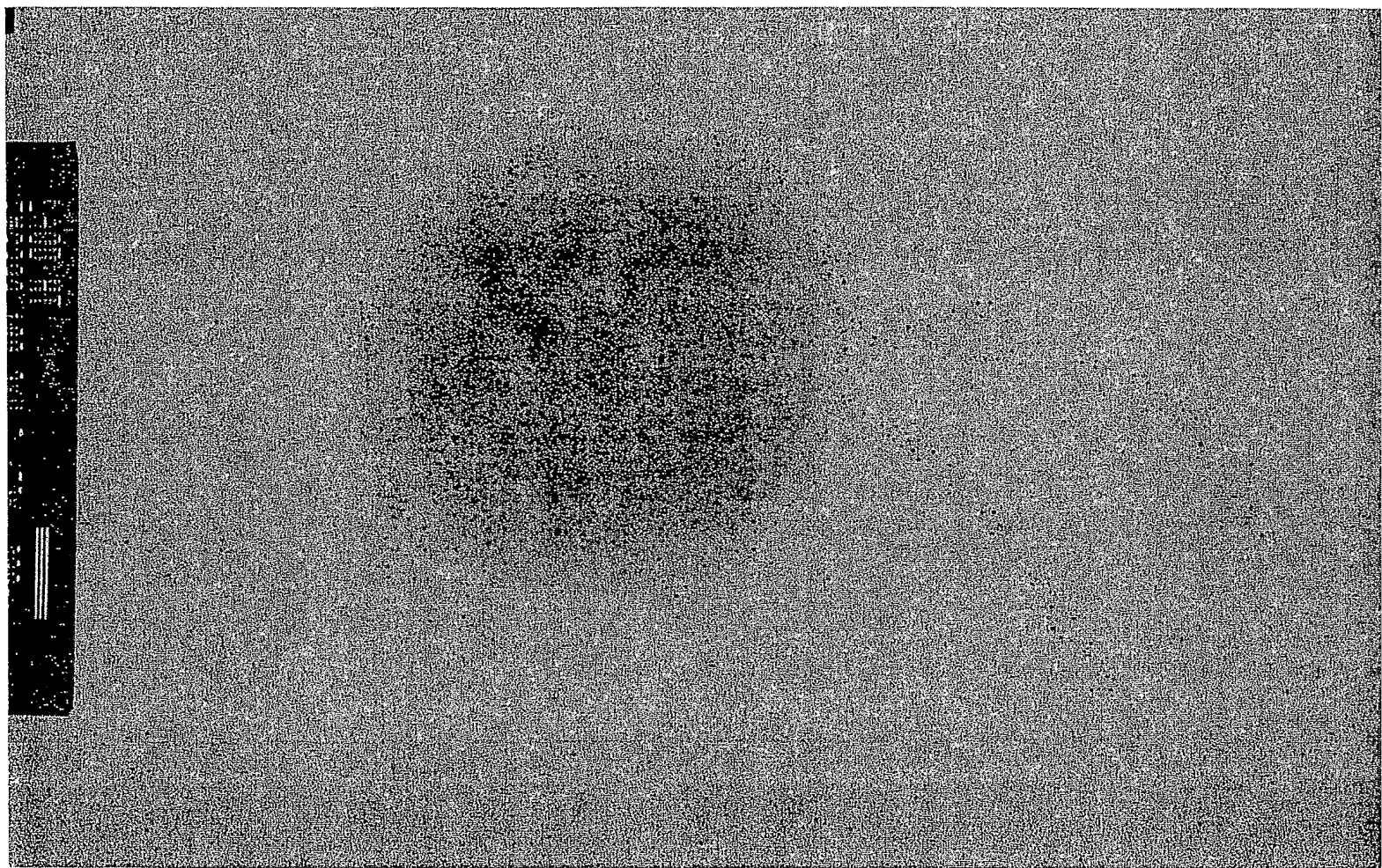
Figure 131





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Figure 132



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Figure 133

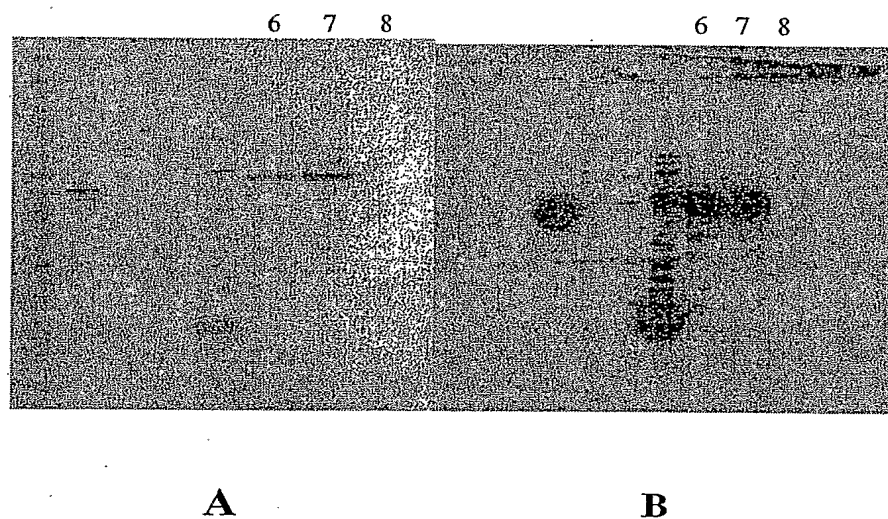
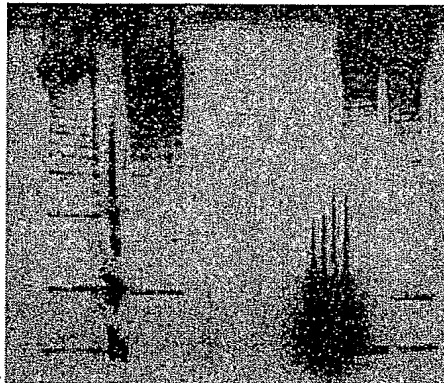




Figure 134

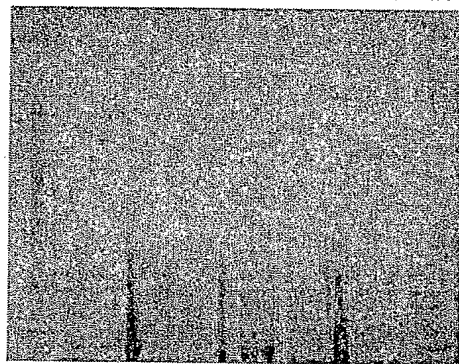
1 2 3 4 5 6 7 8 9 10



PCT/US05/27239 326/487

Figure 135

1 2 3 4 5 6 7 8 9 10



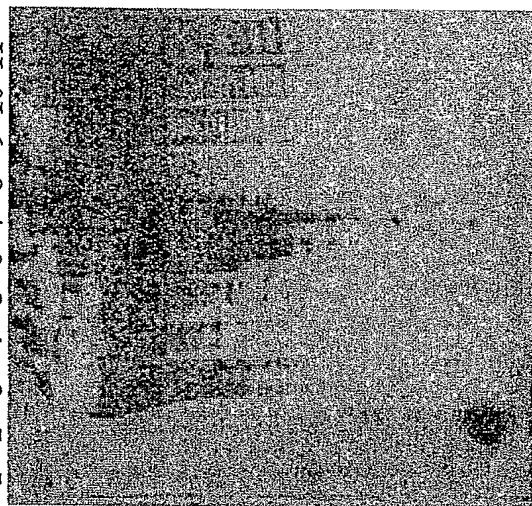
# Pilus released by *Lactococcus* sonication

Figure 136A

1. MK
2. GBS 80 (10 ng)
3. L.lactis-A11 starting material (30', 0.2 OD)
4. L.lactis-A11 (not boiled, 0.33 OD)
5. L.lactis-A11 (5', 0.33 OD)
6. L.lactis-A11 (60' d, 0.33 OD)
7. L.lactis-A11 (30', 0.33 OD)
8. Supernatant (not boiled, 2 OD)
9. Supernatant (5', 2 OD)
10. Supernatant (30', 2 OD)
11. Supernatant (60', 2 OD)

SONICATED

starting material	pellet	supernatant
↓		
1 2 3 4	5 6 7 8	9 10 11



α 80

Figure 136B

1. MK
2. L.lactis-A11
3. L.lactis-A11 starting material (30', 0.2 OD)
4. L.lactis-A11 (not boiled, 0.33 OD)
5. L.lactis-A11 (5', 0.33 OD)
6. L.lactis-A11 (60' d, 0.33 OD)
7. L.lactis-A11 (30', 0.33 OD)
8. Supernatant (not boiled, 2 OD)
9. Supernatant (5', 2 OD)
10. Supernatant (30', 2 OD)
11. Supernatant (60', 2 OD)

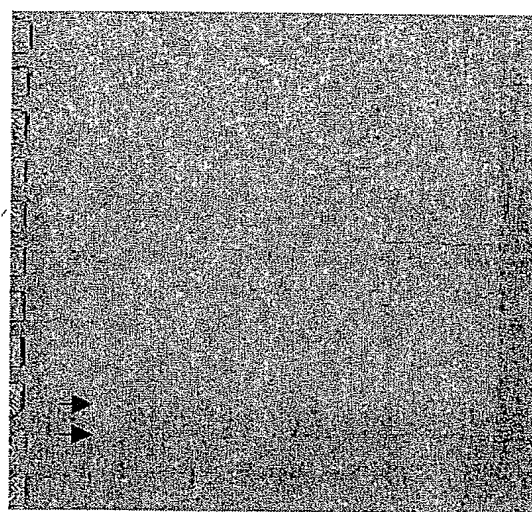


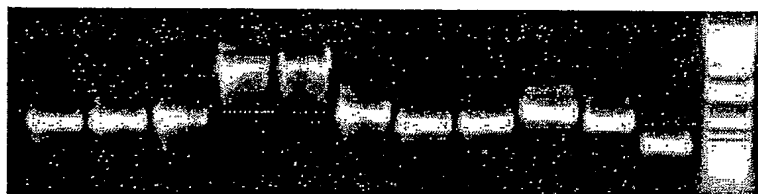




Figure 137



A



TIGR4

B

PCR product	contig_length _TIGR4	overlap
1	754	83
2	759	84
3	847	98
4	2550	99
5	2736	99
6	925	99
7	745	87
8	765	94
9	1008	94
10	802	64
11	461	

Figure 139





## Figure 141A

ORF2_14CSR	MLNKYIEKRITDKITILNILLDIRSIELDELSTLTSLQSKSLLSILQELQETFEELTFN
ORF2_19AH	MLNKYIEKRITDKITILNILLDIRSIELDELSTLTSLQSKSLLSILQELQETFEELTFN
ORF2_19FTW	MLNKYIEKRITDKITILNILLDIRSIELDELSTLTSLQSKSLLSILQELQETFEELTFN
ORF2_23FP	MLNKYIEKRITDKITILNILLDIRSIELDELSTLTSLQSKSLLSILQELQETFEELTFN
ORF2_23FTW	MLNKYIEKRITDKITILNILLDIRSIELDELSTLTSLQSKSLLSILQELQETFEELTFN
ORF2_670	MLNKYIEKRITDKITILNILLDIRSIELDELSTLTSLQSKSLLSILQELQETFEELTFN
ORF2_6BF	MLNKYIEKRITDKITILNILLDIRSIELDELSTLTSLQSKSLLSILQELQETFEELTFN
ORF2_6BSP	MLNKYIEKRITDKITILNILLDIRSIELDELSTLTSLQSKSLLSILQELQETFEELTFN
ORF2_TIGR	MLNKYIEKRITDKITILNILLDIRSIELDELSTLTSLQSKSLLSILQELQETFEELTFN
ORF2_9VSP	MLNKYIEKRITDKITILNILLDIRSIELDELSTLTSLQSKSLLSILQELQETFEELTFN
*****	
ORF2_14CSR	LDTQQVQLIEHSHQTNYYFHQLYNQSTILKILRFFLLQGNQSFNEFTQKEYISIATGYR
ORF2_19AH	LDTQQVQLIEHSHQTNYYFHQLYNQSTILKILRFFLLQGNQSFNEFTQKEYISIATGYR
ORF2_19FTW	LDTQQVQLIEHSHQTNYYFHQLYNQSTILKILRFFLLQGNQSFNEFTQKEYISIATGYR
ORF2_23FP	LDTQQVQLIEHSHQTNYYFHQLYNQSTILKILRFFLLQGNQSFNEFTQKEYISIATGYR
ORF2_23FTW	LDTQQVQLIEHSHQTNYYFHQLYNQSTILKILRFFLLQGNQSFNEFTQKEYISIATGYR
ORF2_670	LDTQQVQLIEHSHQTNYYFHQLYNQSTILKILRFFLLQGNQSFNEFTQKEYISIATGYR
ORF2_6BF	LDTQQVQLIEHSHQTNYYFHQLYNQSTILKILRFFLLQGNQSFNEFTQKEYISIATGYR
ORF2_6BSP	LDTQQVQLIEHSHQTNYYFHQLYNQSTILKILRFFLLQGNQSFNEFTQKEYISIATGYR
ORF2_TIGR	LDTQQVQLIEHSHQTNYYFHQLYNQSTILKILRFFLLQGNQSFNEFTQKEYISIATGYR
ORF2_9VSP	LDTQQVQLIEHSHQTNYYFHQLYNQSTILKILRFFLLQGNQSFNEFTQKEYISIATGYR
*****	
ORF2_14CSR	VRQKCGLLRSVGLDLVKNQVVGPEYRIRFLIALLOFHFGIEIYDLNDGSMWVTHMIVQ
ORF2_19AH	VRQKCGLLRSVGLDLVKNQVVGPEYRIRFLIALLOFHFGIEIYDLNDGSMWVTHMIVQ
ORF2_19FTW	VRQKCGLLRSVGLDLVKNQVVGPEYRIRFLIALLOFHFGIEIYDLNDGSMWVTHMIVQ
ORF2_23FP	VRQKCGLLRSVGLDLVKNQVVGPEYRIRFLIALLOFHFGIEIYDLNDGSMWVTHMIVQ
ORF2_23FTW	VRQKCGLLRSVGLDLVKNQVVGPEYRIRFLIALLOFHFGIEIYDLNDGSMWVTHMIVQ
ORF2_670	VRQKCGLLRSVGLDLVKNQVVGPEYRIRFLIALLOFHFGIEIYDLNDGSMWVTHMIVQ
ORF2_6BF	VRQKCGLLRSVGLDLVKNQVVGPEYRIRFLIALLOFHFGIEIYDLNDGSMWVTHMIVQ
ORF2_6BSP	VRQKCGLLRSVGLDLVKNQVVGPEYRIRFLIALLOFHFGIEIYDLNDGSMWVTHMIVQ
ORF2_TIGR	VRQKCGLLRSVGLDLVKNQVVGPEYRIRFLIALLOFHFGIEIYDLNDGSMWVTHMIVQ
ORF2_9VSP	VRQKCGLLRSVGLDLVKNQVVGPEYRIRFLIALLOFHFGIEIYDLNDGSMWVTHMIVQ
*****	
ORF2_14CSR	SNSQLSHELLEITPDEYVHFSILVALTWKRREFPLEFPESKEFEKLKNLFMPILMEHCQ
ORF2_19AH	SNSQLSHELLEITPDEYVHFSILVALTWKRREFPLEFPESKEFEKLKNLFMPILMEHCQ
ORF2_19FTW	SNSQLSHELLEITPDEYVHFSILVALTWKRREFPLEFPESKEFEKLKNLFMPILMEHCQ
ORF2_23FP	SNSQLSHELLEITPDEYVHFSILVALTWKRREFPLEFPESKEFEKLKNLFMPILMEHCQ
ORF2_23FTW	SNSQLSHELLEITPDEYVHFSILVALTWKRREFPLEFPESKEFEKLKNLFMPILMEHCQ
ORF2_670	SNSQLSHELLEITPDEYVHFSILVALTWKRREFPLEFPESKEFEKLKNLFMPILMEHCQ
ORF2_6BF	SNSQLSHELLEITPDEYVHFSILVALTWKRREFPLEFPESKEFEKLKNLFMPILMEHCQ
ORF2_6BSP	SNSQLSHELLEITPDEYVHFSILVALTWKRREFPLEFPESKEFEKLKNLFMPILMEHCQ
ORF2_TIGR	SNSQLSHELLEITPDEYVHFSILVALTWKRREFPLEFPESKEFEKLKNLFMPILMEHCQ
ORF2_9VSP	SNSQLSHELLEITPDEYVHFSILVALTWKRREFPLEFPESKEFEKLKNLFMPILMEHCQ
*****	
ORF2_14CSR	TYLEPHANMTFTQEELDYIFLVYCSANSSFSKDKWNQEKKTHTIQLILQHTRGKHLLSKF
ORF2_19AH	TYLEPHANMTFTQEELDYIFLVYCSANSSFSKDKWNQEKKTHTIQLILQHTRGKHLLSKF
ORF2_19FTW	TYLEPHANMTFTQEELDYIFLVYCSANSSFSKDKWNQEKKTHTIQLILQHTRGKHLLSKF
ORF2_23FP	TYLEPHANMTFTQEELDYIFLVYCSANSSFSKDKWNQEKKTHTIQLILQHTRGKHLLSKF
ORF2_23FTW	TYLEPHANMTFTQEELDYIFLVYCSANSSFSKDKWNQEKKTHTIQLILQHTRGKHLLSKF
ORF2_670	TYLEPHANMTFTQEELDYIFLVYCSANSSFSKDKWNQEKKTHTIQLILQHTRGKHLLSKF
ORF2_6BF	TYLEPHANMTFTQEELDYIFLVYCSANSSFSKDKWNQEKKTHTIQLILQHTRGKHLLSKF
ORF2_6BSP	TYLEPHANMTFTQEELDYIFLVYCSANSSFSKDKWNQEKKTHTIQLILQHTRGKHLLSKF
ORF2_TIGR	TYLEPHANMTFTQEELDYIFLVYCSANSSFSKDKWNQEKKTHTIQLILQHTRGKHLLSKF
ORF2_9VSP	TYLEPHANMTFTQEELDYIFLVYCSANSSFSKDKWNQEKKTHTIQLILQHTRGKHLLSKF
*****	

## Figure 141B

ORF2\_14CSR KNILGNDISNSLSFLTALTFLTRTFLFGLQNLVPYNNYEHYGIIESDKPLYHISKAIVQE  
ORF2\_19AH KNILGNDISNSLSFLTALTFLTRTFLFGLQNLVPYNNYEHYGIIESDKPLYHISKAIVQE  
ORF2\_19FTW KNILGNDISNSLSFLTALTFLTRTFLFGLQNLVPYNNYEHYGIIESDKPLYHISKAIVQE  
ORF2\_23FP KNILGNDISNSLSFLTALTFLTRTFLFGLQNLVPYNNYEHYGIIESDKPLYHISKAIVQE  
ORF2\_23FTW KNILGNDISNSLSFLTALTFLTRTFLFGLQNLVPYNNYEHYGIIESDKPLYHISKAIVQE  
ORF2\_670 KNILGNDISNSLSFLTALTFLTRTFLFGLQNLVPYNNYEHYGIIESDKPLYHISKAIVQE  
ORF2\_6BF KNILGNDISNSLSFLTALTFLTRTFLFGLQNLVPYNNYEHYGIIESDKPLYHISKAIVQE  
ORF2\_6BSP KNILGNDISNSLSFLTALTFLTRTFLFGLQNLVPYNNYEHYGIIESDKPLYHISKAIVQE  
ORF2\_TIGR KNILGNDISNSLSFLTALTFLTRTFLFGLQNLVPYNNYEHYGIIESDKPLYHISKAIVQE  
ORF2\_9VSP KNILGNDISNSLSFLTALTFLTRTFLFGLQNLVPYNNYEHYGIIESDKPLYHISKAIVQE  
\*\*\*\*\*

ORF2\_14CSR WMTEQKIEGVIDQHRLYLFSLYLTETIFSSSLPAIPFIILNNQADVNLIKSIILRNFTDK  
ORF2\_19AH WMTEQKIEGVIDQHRLYLFSLYLTETIFSSSLPAIPFIILNNQADVNLIKSIILRNFTDK  
ORF2\_19FTW WMTEQKIEGVIDQHRLYLFSLYLTETIFSSSLPAIPFIILNNQADVNLIKSIILRNFTDK  
ORF2\_23FP WMTEQKIEGVIDQHRLYLFSLYLTETIFSSSLPAIPFIILNNQADVNLIKSIILRNFTDK  
ORF2\_23FTW WMTEQKIEGVIDQHRLYLFSLYLTETIFSSSLPAIPFIILNNQADVNLIKSIILRNFTDK  
ORF2\_670 WMTEQKIEGVIDQHRLYLFSLYLTETIFSSSLPAIPFIILNNQADVNLIKSIILRNFTDK  
ORF2\_6BF WMTEQKIEGVIDQHRLYLFSLYLTETIFSSSLPAIPFIILNNQADVNLIKSIILRNFTDK  
ORF2\_6BSP WMTEQKIEGVIDQHRLYLFSLYLTETIFSSSLPAIPFIILNNQADVNLIKSIILRNFTDK  
ORF2\_TIGR WMTEQKIEGVIDQHRLYLFSLYLTETIFSSSLPAIPFIILNNQADVNLIKSIILRNFTDK  
ORF2\_9VSP WMTEQKIEGVIDQHRLYLFSLYLTETIFSSSLPAIPFIILNNQADVNLIKSIILRNFTDK  
\*\*\*\*\*

ORF2\_14CSR VASVTGYNILISPPPSEHLTEPLIIITTKKEYLPYVKKQYPKGKHHFLTIALDLHVSQQR  
ORF2\_19AH VASVTGYNILISPPPSEHLTEPLIIITTKKEYLPYVKKQYPKGKHHFLTIALDLHVSQQR  
ORF2\_19FTW VASVTGYNILISPPPSEHLTEPLIIITTKKEYLPYVKKQYPKGKHHFLTIALDLHVSQQR  
ORF2\_23FP VASVTGYNILISPPPSEHLTEPLIIITTKKEYLPYVKKQYPKGKHHFLTIALDLHVSQQR  
ORF2\_23FTW VASVTGYNILISPPPSEHLTEPLIIITTKKEYLPYVKKQYPKGKHHFLTIALDLHVSQQR  
ORF2\_670 VASVTGYNILISPPPSEHLTEPLIIITTKKEYLPYVKKQYPKGKHHFLTIALDLHVSQQR  
ORF2\_6BF VASVTGYNILISPPPSEHLTEPLIIITTKKEYLPYVKKQYPKGKHHFLTIALDLHVSQQR  
ORF2\_6BSP VASVTGYNILISPPPSEHLTEPLIIITTKKEYLPYVKKQYPKGKHHFLTIALDLHVSQQR  
ORF2\_TIGR VASVTGYNILISPPPSEHLTEPLIIITTKKEYLPYVKKQYPKGKHHFLTIALDLHVSQQR  
ORF2\_9VSP VASVTGYNILISPPPSEHLTEPLIIITTKKEYLPYVKKQYPKGKHHFLTIALDLHVSQQR  
\*\*\*\*\*

ORF2\_14CSR LIYQTIVDIRKEAFDKRVAMIAKKAHYLL  
ORF2\_19AH LIYQTIVDIRKEAFDKRVAMIAKKAHYLL  
ORF2\_19FTW LIYQTIVDIRKEAFDKRVAMIAKKAHYLL  
ORF2\_23FP LIYQTIVDIRKEAFDKRVAMIAKKAHYLL  
ORF2\_23FTW LIYQTIVDIRKEAFDKRVAMIAKKAHYLL  
ORF2\_670 LIYQTIVDIRKEAFDKRVAMIAKKAHYLL  
ORF2\_6BF LIYQTIVDIRKEAFDKRVAMIAKKAHYLL  
ORF2\_6BSP LIYQTIVDIRKEAFDKRVAMIAKKAHYLL  
ORF2\_TIGR LIYQTIVDIRKEAFDKRVAMIAKKAHYLL  
ORF2\_9VSP LIYQTIVDIRKEAFDKRVAMIAKKAHYLL  
\*\*\*\*\*



Figure 142A

```

ORF3_19AH      MKKVRKIFQKAVAGLCCISQLTAFSSIVALAETPETSIPAIGKVVIKETGEGGALLGDAVF
ORF3_23FP      MKKVRKIFQKAVAGLCCISQLTAFSSIVALAETPETSIPAIGKVVIKETGEGGALLGDAVF
ORF3_14CSR     MKKVRKIFQKAVAGLCCISQLTAFSSIVALAETPETSIPAIGKVVIKETGEGGALLGDAVF
ORF3_670       MKKVRKIFQKAVAGLCCISQLTAFSSIVALAETPETSIPAIGKVVIKETGEGGALLGDAVF
ORF3_6BF       MKKVRKIFQKAVAGLCCISQLTAFSSIVALAETPETSIPAIGKVVIKETGEGGALLGDAVF
ORF3_6BSP      MKKVRKIFQKAVAGLCCISQLTAFSSIVALAETPETSIPAIGKVVIKETGEGGALLGDAVF
ORF3_19FTW     MKKVRKIFQKAVAGLCCISQLTAFSSIVALAETPETSIPAIGKVVIKETGEGGALLGDAVF
ORF3_9VSP      MKKVRKIFQKAVAGLCCISQLTAFSSIVALAETPETSIPAIGKVVIKETGEGGALLGDAVF
ORF3_23FTW     MKKVRKIFQKAVAGLCCISQLTAFSSIVALAETPETSIPAIGKVVIKETGEGGALLGDAVF
ORF3_TIGR      MKKVRKIFQKAVAGLCCISQLTAFSSIVALAETPETSIPAIGKVVIKETGEGGALLGDAVF
*****

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ORF3_19AH      ELKNNTDGTTVSQRTEAQTGEAIFSNIKPGTYTLTEAQPVPVGYKPSTKQWTVEVEKNGRT
ORF3_23FP      ELKNNTDGTTVSQRTEAQTGEAIFSNIKPGTYTLTEAQPVPVGYKPSTKQWTVEVEKNGRT
ORF3_14CSR     ELKNNTDGTTVSQRTEAQTGEAIFSNIKPGTYTLTEAQPVPVGYKPSTKQWTVEVEKNGRT
ORF3_670       ELKNNTDGTTVSQRTEAQTGEAIFSNIKPGTYTLTEAQPVPVGYKPSTKQWTVEVEKNGRT
ORF3_6BF       ELKNNTDGTTVSQRTEAQTGEAIFSNIKPGTYTLTEAQPVPVGYKPSTKQWTVEVEKNGRT
ORF3_6BSP      ELKNNTDGTTVSQRTEAQTGEAIFSNIKPGTYTLTEAQPVPVGYKPSTKQWTVEVEKNGRT
ORF3_19FTW     ELKNNTDGTTVSQRTEAQTGEAIFSNIKPGTYTLTEAQPVPVGYKPSTKQWTVEVEKNGRT
ORF3_9VSP      ELKNNTN GTTVSQRTEAQTGEAIFSNIKPGTYTLTEAQPVPVGYKPSTKQRTVEVEKNGRT
ORF3_23FTW     ELKNNTDGTTVSQRTEAQTGEAIFSNIKPGTYTLTEAQPVPVGYKPSTKQWTVEVEKNGRT
ORF3_TIGR      ELKNNTDGTTVSQRTEAQTGEAIFSNIKPGTYTLTEAQPVPVGYKPSTKQWTVEVEKNGRT
*****:*****

```

ORF3\_19AH TVQGEQVENREEALSDQYPQTGTYPDVQTPYQIIKVDGSEKNGQHKALNPNPYERVIPEG  
ORF3\_23FP TVQGEQVENREEALSDQYPQTGTYPDVQTPYQIIKVDGSEKNGQHKALNPNPYERVIPEG  
ORF3\_14CSR TVQGEQVENREEALSDQYPQTGTYPDVQTPYQIIKVDGSEKNGQHKALNPNPYERVIPEG  
ORF3\_670 TVQGEQVENREEALSDQYPQTGTYPDVQTPYQIIKVDGSEKNGQHKALNPNPYERVIPEG  
ORF3\_6BF TVQGEQVENREEALSDQYPQTGTYPDVQTPYQIIKVDGSEKNGQHKALNPNPYERVIPEG  
ORF3\_6BSP TVQGEQVENREEALSDQYPQTGTYPDVQTPYQIIKVDGSEKNGQHKALNPNPYERVIPEG  
ORF3\_19FTW TVQGEQVENREEALSDQYPQTGTYPDVQTPYQIIKVDGSEKNGQHKALNPNPYERVIPEG  
ORF3\_9VSP TVQGEQVENREEALSDQYPQTGTYPDVQTPYQIIKVDGSEKNGQHKALNPNPYERVIPEG  
ORF3\_23FTW TVQGEQVENREEALSDQYPQTGTYPDVQTPYQIIKVDGSEKNGQHKALNPNPYERVIPEG  
ORF3\_TIGR TVQGEQVENREEALSDQYPQTGTYPDVQTPYQIIKVDGSEKNGQHKALNPNPYERVIPEG  
\*\*\*\*\*

```

ORF3_19AH      TLSKRIYQVNNLDDNQYGIELTVSGKTTVETKEASTPLDVVILLDNSNSMSNIRHNHAHR
ORF3_23FP      TLSKRIYQVNNLDDNQYGIELTVSGKTTVETKEASTPLDVVILLDNSNSMSNIRHNHAHR
ORF3_14CSR     TLSKRIYQVNNLDDNQYGIELTVSGKTTVETKEASTPLDVVILLDNSNSMSNIRHNHAHR
ORF3_670       TLSKRIYQVNNLDDNQYGIELTVSGKTTVETKEASTPLDVVILLDNSNSMSNIRHNHAHR
ORF3_6BF       TLSKRIYQVNNLDDNQYGIELTVSGKTTVETKEASTPLDVVILLDNSNSMSNIRHNHAHR
ORF3_6BSP      TLSKRIYQVNNLDDNQYGIELTVSGKTTVETKEASTPLDVVILLDNSNSMSNIRHNHAHR
ORF3_19FTW     TLSKRIYQVNNLDDNQYGIELTVSGKTVYERKDKSVPLDVVILLDNSNSMSNIRNKNARR
ORF3_9VSP      TLSKRIYQVNNLDDNQYGIELTVSGKTVYERKDKSVPLDVVILLDNSNSMSNIRNKNARR
ORF3_23FTW     TLSKRIYQVNNLDDNQYGIELTVSGKTVYEQKDKSVPLDVVILLDNSNSMSNIRNKNARR
ORF3_TIGR      TLSKRIYQVNNLDDNQYGIELTVSGKTVYEQKDKSVPLDVVILLDNSNSMSNIRNKNARR
*****

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```
ORF3_19AH      AEKAGEATRALVDKITSNPDNRVALVTYGSTIFDGSEATVEKGVDANGKILNDSALWTF
ORF3_23FP      AEKAGEATRALVDKITSNPDNRVALVTYGSTIFDGSEATVEKGVDANGKILNDSALWTF
ORF3_14CSR     AEKAGEATRALVDKITSNPDNRVALVTYGSTIFDGSEATVEKGVDANGKILNDSALWTF
ORF3_670       AEKAGEATRALVDKITSNPDNRVALVTYGSTIFDGSEATVEKGVDANGKILNDSALWTF
ORF3_6BF       AEKAGEATRALVDKITSNPDNRVALVTYGSTIFDGSEATVEKGVDANGKILNDSALWTF
ORF3_6BSP      AEKAGEATRALVDKITSNPDNRVALVTYGSTIFDGSEATVEKGVDANGKILNDSALWTF
ORF3_19FTW     AERAGEATRSLIDKITSDPENRVALVTYASTIFDGTTEFTVEKGVDKNGKRNLDSLFWNY
ORF3_9VSP      AERAGEATRSLIDKITSDPENRVALVTYASTIFDGTTEFTVEKGVDKNGKRNLDSLFWNY
ORF3_23FTW     AERAGEATRSLIDKITSDPENRVALVTYASTIFDGTTEFTVEKGVDKNGKRNLDSLFWNY
ORF3_TIGR      AERAGEATRSLIDKITSDSENRAVLTYASTIFDGTTEFTVEKGVDKNGKRNLDSLFWNY
*:*****:*:*****.:*****.*****.****** ** * * *-
```

DRTTFTAKTYNYSFLNLTSDPDTDIQTIKDRIPSDAEELNKDKLMYQFGATFTQKALMTAD  
DRTTFTAKTYNYSFLNLTSDPDTDIQTIKDRIPSDAEELNKDKLMYQFGATFTQKALMTAD  
DRTTFTAKTYNYSFLNLTSDPDTDIQTIKDRIPSDAEELNKDKLMYQFGATFTQKALMTAD  
DRTTFTAKTYNYSFLNLTSDPDTDIQTIKDRIPSDAEELNKDKLMYQFGATFTQKALMTAD  
DRTTFTAKTYNYSFLNLTSDPDTDIQTIKDRIPSDAEELNKDKLMYQFGATFTQKALMTAD  
DRTTFTAKTYNYSFLNLTSDPDTDIQTIKDRIPSDAEELNKDKLMYQFGATFTQKALMTAD  
DQTSETNTTKDY SYLKL TNDKN D IVELKNKV PTEAEDHDGNRLMY QFGATFTQKALMKAD  
DQTSETNTTKDY SYLKL TNDKN D IVELKNKV PTEAEDHDGNRLMY QFGATFTQKALMKAD  
DQTSETNTTKDY SYLKL TNDKN D IVELKNKV PTEAEDHDGNRLMY QFGATFTQKALMKAD  
DQTSETNTTKDY SYLKL TNDKN D IVELKNKV PTEAEDHDGNRLMY QFGATFTQKALMKAD  
\*: \*: \*: \*: \*: \*: \*: \*: \*: \*. \*\* : : : : : : : : : : : : : : : : : : : \*

DILTKQARPNSKKVIFHITDGVPTMSYPINFKYTGTTQSYRTQLNNFKAKTPNSSGILLE  
DILTKQARPNSKKVIFHITDGVPTMSYPINFKYTGTTQSYRTQLNNFKAKTPNSSGILLE  
DILTKQARPNSKKVIFHITDGVPTMSYPINFKYTGTTQSYRTQLNNFKAKTPNSSGILLE  
DILTKQARPNSKKVIFHITDGVPTMSYPINFKYTGTTQSYRTQLNNFKAKTPNSSGILLE  
DILTKQARPNSKKVIFHITDGVPTMSYPINFKYTGTTQSYRTQLNNFKAKTPNSSGILLE  
DILTKQARPNSKKVIFHITDGVPTMSYPINFKYTGTTQSYRTQLNNFKAKTPNSSGILLE  
EILTQOARQNSQKVI F H I T D G V P T M S Y P I N F N H A T F A P S Y Q N Q L N A F F S K S P N K D G I L L S  
EILTQOARQNSQKVI F H I T D G V P T M S Y P I N F N H A T F A P S Y Q N Q L N V F F S K S P N K D G I L L S  
EILTQOARQNSQKVI F H I T D G V P T M S Y P I N F N H A T F A P S Y Q N Q L N A F F S K S P N K D G I L L S  
EILTQOARQNSQKVI F H I T D G V P T M S Y P I N F N H A T F A P S Y Q N Q L N A F F S K S P N K D G I L L S  
\*\*\*:\*\*\* \*:\*\*\*\*\*::: :\*:\*:\*:\*:\*:\*\*\*:\*\*\*

```

DFV TWSADGEHKIVRGDGESYQMFTKKPVTDQYGVHQILSITSMEQRAKLV SAGYRFYGT
DFV TWSADGEHKIVRGDGESYQMFTKKPVTDQYGVHQILSITSMEQRAKLV SAGYRFYGT
DFV TWSADGEHKIVRGDGESYQMFTKKPVTDQYGVHQILSITSMEQRAKLV SAGYRFYGT
DFV TWSADGEHKIVRGDGESYQMFTKKPVTDQYGVHQILSITSMEQRAKLV SAGYRFYGT
DFV TWSADGEHKIVRGDGESYQMFTKKPVTDQYGVHQILSITSMEQRAKLV SAGYRFYGT
DFV TWSADGEHKIVRGDGESYQMFTKKPVTDQYGVHQILSITSMEQRAKLV SAGYRFYGT
DFITQATSGEHTIVRGDQGSYQMFTDKTVYEEK-GAPAAFPVK-PEKYS E MKA VGYAVIGD
DFITQATSGEHTIVRGDQGSYQMFTDKTVYEEK-GAPAAFPVK-PEKYS E MKA VGYAVIGD
DFITQATSGEHTIVRGDQGSYQMFTDKTVYEEK-GAPAAFPVK-PEKYS E MKA VGYAVIGD
DFITQATSGEHTIVRGDQGSYQMFTDKTVYEEK-GAPAAFPVK-PEKYS E MKA VGYAVIGD
**:* :.:***.*****:*****.*:* :.:* :.:* :.:* :.:* :.:* :.:* :.:*

```

```

-----DLYLYWRDSILAYPFNSSTDWITNHGDPPTTWYYNGNMAQDGYDVFTVGVGVNGDP
-----DLYLYWRDSILAYPFNSSTDWITNHGDPPTTWYYNGNMAQDGYDVFTVGVGVNGDP
-----DLYLYWRDSILAYPFNSSTDWITNHGDPPTTWYYNGNMAQDGYDVFTVGVGVNGDP
-----DLYLYWRDSILAYPFNSSTDWITNHGDPPTTWYYNGNMAQDGYDVFTVGVGVNGDP
-----DLYLYWRDSILAYPFNSSTDWITNHGDPPTTWYYNGNMAQDGYDVFTVGVGVNGDP
-----DLYLYWRDSILAYPFNSSTDWITNHGDPPTTWYYNGNMAQDGYDVFTVGVGVNGDP
PINGGYIWLNWRESILAYPFNSNTAKITNHGAPTRWYYNGNIAPDGYDVFTVIGIGINGDP
PINGGYIWLNWRESILAYPFNSNTAKITNHGDPTRWYYNGNIAPDGYDVFTVIGIGINGDP
PINGGYIWLNWRESILAYPFNSNTAKITNHGDPTRWYYNGNIAPDGYDVFTVIGIGINGDP
PINGGYIWLNWRESILAYPFNSNTAKITNHGDPTRWYYNGNIAPDGYDVFTVIGIGINGDP
::* **:*:*****.* ***** ** *****:*****:*****

```

GTDEATATRFMQSISSSPDNYTNVADPSQILQELNRYFYTIVNEKKSIENTGTTDPMGEL  
GTDEATATRFMQSISSSPDNYTNVADPSQILQELNRYFYTIVNEKKSIENTGTTDPMGEL  
GTDEATATRFMQSISSSPDNYTNVADPSQILQELNRYFYTIVNEKKSIENTGTTDPMGEL  
GTDEATATRFMQSISSSPDNYTNVADPSQILQELNRYFYTIVNEKKSIENTGTTDPMGEL  
GTDEATATRFMQSISSSPDNYTNVADPSQILQELNRYFYTIVNEKKSIENTGTTDPMGEL  
GTDEATATRFMQSISSSPDNYTNVADPSQILQELNRYFYTIVNEKKSIENTGTTDPMGEL  
GTDEATATSFMQSISSEKPNYTNVTDTTKILEQLNRYFHTIVTEKKSIENGTTDPMGEL  
GTDEATATSFMQSISSEKPNYTNVTDTTKILEQLNRYFHTIVTEKKSIENGTTDPMGEL  
GTDEATATSFMQSISSEKPNYTNVTDTTKILEQLNRYFHTIVTEKKSIENGTTDPMGEL  
GTDEATATSFMQSISSEKPNYTNVTDTTKILEQLNRYFHTIVTEKKSIENGTTDPMGEL  
\*\*\*\*\* : \*\*\*\*\* \* : : : \*\*\*\*\* - \*\*\* : \*\*\*\*\*

## Figure 142C

```
ORF3_19AH      IDFLQADGRFDPADYTLTANDGSSLVNNVPTGGPQNDGGLLKNKAVFYDTEKIRIVTG
ORF3_23FP      IDFLQADGRFDPADYTLTANDGSSLVNNVPTGGPQNDGGLLKNKAVFYDTEKIRIVTG
ORF3_14CSR     IDFLQADGRFDPADYTLTANDGSSLVNNVPTGGPQNDGGLLKNKAVFYDTEKIRIVTG
ORF3_670       IDFLQADGRFDPADYTLTANDGSSLVNNVPTGGPQNDGGLLKNKAVFYDTEKIRIVTG
ORF3_6BF       IDFLQADGRFDPADYTLTANDGSSLVNNVPTGGPQNDGGLLKNKAVFYDTEKIRIVTG
ORF3_6BSP      IDFLQADGRFDPADYTLTANDGSSLVNNVPTGGPQNDGGLLKNKAVFYDTEKIRIVTG
ORF3_19FTW     IDLQLGTDGRFDPADYTLTANDGSRLENGQAVGGPQNDGGLLKNKAVFYDTEKIRIVTG
ORF3_9VSP      IDLQLGTDGRFDPADYTLTANDGSRLENGQAVGGPQNDGGLLKNKAVFYDTEKIRIVTG
ORF3_23FTW     IDLQLGTDGRFDPADYTLTANDGSRLENGQAVGGPQNDGGLLKNKAVFYDTEKIRIVTG
ORF3_TIGR      IDLQLGTDGRFDPADYTLTANDGSRLENGQAVGGPQNDGGLLKNKAVFYDTEKIRIVTG
                *****

ORF3_19AH      LYLGTGEKVTLTYNVRLNDQFVSNKFYDTNGRTTLHPKEVEKNTVRDFPIPKIRDVRKYP
ORF3_23FP      LYLGTGEKVTLTYNVRLNDQFVSNKFYDTNGRTTLHPKEVEKNTVRDFPIPKIRDVRKYP
ORF3_14CSR     LYLGTGEKVTLTYNVRLNDQFVSNKFYDTNGRTTLHPKEVEKNTVRDFPIPKIRDVRKYP
ORF3_670       LYLGTGEKVTLTYNVRLNDQFVSNKFYDTNGRTTLHPKEVEKNTVRDFPIPKIRDVRKYP
ORF3_6BF       LYLGTGEKVTLTYNVRLNDQFVSNKFYDTNGRTTLHPKEVEKNTVRDFPIPKIRDVRKYP
ORF3_6BSP      LYLGTGEKVTLTYNVRLNDQFVSNKFYDTNGRTTLHPKEVEKNTVRDFPIPKIRDVRKYP
ORF3_19FTW     LYLGTGEKVTLTYNVRLNDQFVSNKFYDTNGRTTLHPKEVEKNTVRDFPIPKIRDVRKYP
ORF3_9VSP      LYLGTGEKVTLTYNVRLNDQFVSNKFYDTNGRTTLHPKEVEKNTVRDFPIPKIRDVRKYP
ORF3_23FTW     LYLGTGEKVTLTYNVRLNDQFVSNKFYDTNGRTTLHPKEVEKNTVRDFPIPKIRDVRKYP
ORF3_TIGR      LYLGTGEKVTLTYNVRLNDQFVSNKFYDTNGRTTLHPKEVEKNTVRDFPIPKIRDVRKYP
                *****

ORF3_19AH      EITIPKEKKLGEIEFIKINKNDKKPLRDAVFSLQKQHPDYDPIYGAIDQNGTYQNVRTGE
ORF3_23FP      EITIPKEKKLGEIEFIKINKNDKKPLRDAVFSLQKQHPDYDPIYGAIDQNGTYQNVRTGE
ORF3_14CSR     EITIPKEKKLGEIEFIKINKNDKKPLRDAVFSLQKQHPDYDPIYGAIDQNGTYQNVRTGE
ORF3_670       EITIPKEKKLGEIEFIKINKNDKKPLRDAVFSLQKQHPDYDPIYGAIDQNGTYQNVRTGE
ORF3_6BF       EITIPKEKKLGEIEFIKINKNDKKPLRDAVFSLQKQHPDYDPIYGAIDQNGTYQNVRTGE
ORF3_6BSP      EITIPKEKKLGEIEFIKINKNDKKPLRDAVFSLQKQHPDYDPIYGAIDQNGTYQNVRTGE
ORF3_19FTW     AITIAKEKKLGEIEFIKINKNDKKPLRDAVFSLQKQHPDYDPIYGAIDQNGTYQNVRTGE
ORF3_9VSP      AITIAKEKKLGEIEFIKINKNDKKPLRDAVFSLQKQHPDYDPIYGAIDQNGTYQNVRTGE
ORF3_23FTW     EITISKEKKLGDIEFIKVNKNDKKPLRDAVFSLQKQHPDYDPIYGAIDQNGTYQNVRTGE
ORF3_TIGR      EITISKEKKLGDIEFIKVNKNDKKPLRDAVFSLQKQHPDYDPIYGAIDQNGTYQNVRTGE
                *****

ORF3_19AH      DGKLTFFKNLSDGKRIEENSEPAKPVQNKPIVAFQIVNGEVRDVTISIVPDIPAGYEF
ORF3_23FP      DGKLTFFKNLSDGKRIEENSEPAKPVQNKPIVAFQIVNGEVRDVTISIVPDIPAGYEF
ORF3_14CSR     DGKLTFFKNLSDGKRIEENSEPAKPVQNKPIVAFQIVNGEVRDVTISIVPDIPAGYEF
ORF3_670       DGKLTFFKNLSDGKRIEENSEPAKPVQNKPIVAFQIVNGEVRDVTISIVPDIPAGYEF
ORF3_6BF       DGKLTFFKNLSDGKRIEENSEPAKPVQNKPIVAFQIVNGEVRDVTISIVPDIPAGYEF
ORF3_6BSP      DGKLTFFKNLSDGKRIEENSEPAKPVQNKPIVAFQIVNGEVRDVTISIVPDIPAGYEF
ORF3_19FTW     DGKLTFFKNLSDGKRIEENSEPAKPVQNKPIVAFQIVNGEVRDVTISIVPDIPAGYEF
ORF3_9VSP      DGKLTFFKNLSDGKRIEENSEPAKPVQNKPIVAFQIVNGEVRDVTISIVPDIPAGYEF
ORF3_23FTW     DGKLTFFKNLSDGKRIEENSEPAKPVQNKPIVAFQIVNGEVRDVTISIVPDIPAGYEF
ORF3_TIGR      DGKLTFFKNLSDGKRIEENSEPAKPVQNKPIVAFQIVNGEVRDVTISIVPDIPAGYEF
                *****

ORF3_19AH      TNDKHYITNEPIPPKREYPTGGIGMLPFYLIGCMMMGGVLLYTRKNP
ORF3_23FP      TNDKHYITNEPIPPKREYPTGGIGMLPFYLIGCMMMGGVLLYTRKNP
ORF3_14CSR     TNDKHYITNEPIPPKREYPTGGIGMLPFYLIGCMMMGGVLLYTRKHP
ORF3_670       TNDKHYITNEPIPPKREYPTGGIGMLPFYLIGCMMMGGVLLYTRKHP
ORF3_6BF       TNDKHYITNEPIPPKREYPTGGIGMLPFYLIGCMMMGGVLLYTRKHP
ORF3_6BSP      TNDKHYITNEPIPPKREYPTGGIGMLPFYLIGCMMMGGVLLYTRKHP
ORF3_19FTW     TNDKHYITNEPIPPKREYPTGGIGMLPFYLIGCMMMGGVLLYTRKHP
ORF3_9VSP      TNDKHYITNEPIPPKREYPTGGIGMLPFYLIGCMMMGGVLLYTRKHP
ORF3_23FTW     TNDKHYITNEPIPPKREYPTGGIGMLPFYLIGCMMMGGVLLYTRKHP
ORF3_TIGR      TNDKHYITNEPIPPKREYPTGGIGMLPFYLIGCMMMGGVLLYTRKHP
                *****
```



Figure 143A

## Figure 143A

ORF4_6BF	PSNATFATSFWSDEMTEGLTYN-EDVTITLNNVAMDQADYEVTKGNNGFNLKLTEAGLAK
ORF4_6BSP	PSNATFATSFWSDEMTEGLTYN-EDVTITLNNVAMDQADYEVTKGNNGFNLKLTEAGLAK
ORF4_670	PSNATFATSFWSDEMTEGLTYN-EDVTITLNNVAMDQADYEVTKGNNGFNLKLTEAGLAK
ORF4_14CSR	PSNATFATSFWSDEMTEGLTYN-EDVTITLNNVAMDQADYEVTKGNNGFNLKLTEAGLAK
ORF4_19AH	PSNATFATSFWSDEMTEGLTYN-EDVTITLNNVAMDQADYEVTKGXNGFNFLKLTEAGLAK
ORF4_23FP	PSNATFATSFWSDEMTEGLTYN-EDVTITLNNVAMDQADYEVTKINGFNFLKLTEAGLAK
ORF4_23FTW	PKNSTLATAFWSDEMTEGLDYN-GDVVVNYNGQPLDNSHYTLEAGHNGFILKLNKGLEA
ORF4_19FTW	PALANYATANWSDRMTEGLAFNKGTVKVTVDVALEAGDYALTEVATGFDLKLTDAGLAK
ORF4_9VSP	PALANYATANWSDRMTEGLAFNKGTVKVTVDVALEAGDYALTEVATGFDLKLTDAGLAK
ORF4_TIGR	PALANYATANWSDRMTEGLAFNKGTVKVTVDVALEAGDYALTEVATGFDLKLTDAGLAK
	* : . ** : ***.***** : * : *

## Figure 143B

[illegible]

PCT/US2005/027239

## Figure 143C

ORF4_6BF	AKIDD-VEFVVGAGSWNQ--EFNYLKDVQKNDATKVVNKKITIPOTGGIGTIIFAV
ORF4_6BSP	AKIDD-VEFVVGAGSWNQ--EFNYLKDVQKNDATKVVNKKITIPOTGGIGTIIFAV
ORF4_670	AKIDD-VEFVVGAGSWNQ--EFNYLKDVQKNDATKVVNKKITIPOTGGIGTIIFAV
ORF4_14CSR	AKIDD-VEFVVGAGSWNQ--EFNYLKDVQKNDATKVVNKKITIPOTGGIGTIIFAV
ORF4_19AH	AKIDD-VEFVVGAGSWNQ--EFNYLKDVQKNDATKVVNKKITIPOTGGIGTIIFAV
ORF4_23FP	AKIDD-VEFVVGAGSWNQ--EFNYLKDVQKNDATKVVNKKITIPOTGGIGTIIFAV
ORF4_23FTW	AKLGD-VKFEVGAGSWNQ--DFNYLKDVQKNDATKVVNKKITIPOTGGIGTIIFAV
ORF4_19FTW	ALLTSRQKFEVTATSYSATGQGIETAGSGKDDATKVVNKKITIPOTGGIGTIIFAV
ORF4_9VSP	ALLTSRQKFEVTATSYSATGQGIETAGSGKDDATKVVNKKITIPOTGGIGTIIFAV
ORF4_TIGR	ALLTSRQKFEVTATSYSATGQGIETAGSGKDDATKVVNKKITIPOTGGIGTIIFAV

\*:\* : . : \* \* \* \* : . : \* . \* : \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \*

ORF4_6BF	AGAAIMGIAYVYVKNKDEDQLA
ORF4_6BSP	AGAAIMGIAYVYVKNKDEDQLA
ORF4_670	AGAAIMGIAYVYVKNKDEDQLA
ORF4_14CSR	AGAAIMGIAYVYVKNKDEDQLA
ORF4_19AH	AGAAIMGIAYVYVKNKDEDQLA
ORF4_23FP	AGAVIMGIAYVYVKNKDEDQLA
ORF4_23FTW	AGAVIMGIAYVYVKNKDEDQLA
ORF4_19FTW	AGAVIMGIAYVYVKNKDEDQLA
ORF4_9VSP	AGAVIMGIAYVYVKNKDEDQLA
ORF4_TIGR	AGAAIMGIAYVYVKNKDEDQLA

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## Figure 144A

ORF5\_6BSP -----MTMQMKQKMISRIFFVMALCFSLVWGAHAVQAQEDHTLVLQLENYQEV  
ORF5\_TIGR -----MTMQMKQKMISRIFFVMALCFSLVWGAHAVQAQEDHTLVLQLENYQEV  
ORF5\_6BF -----MTMQMKQKMISRIFFVMALCFSLVWGAHAVQAQEDHTLVLQLENYQEV  
ORF5\_670 -----MTMQMKQKMISRIFFVMALCFSLVWGAHAVQAQEDHTLVLQLENYQEV  
ORF5\_19AH -----MTMQMKQKMISRIFFVMALCFSLVWGAHAVQAQEDHTLVLQLENYQEV  
ORF5\_14CSR -----MTMQMKQKMISRIFFVMALCFSLVWGAHAVQAQEDHTLVLQLENYQEV  
ORF5\_19FTW -----MTMQMKQKMISRIFFVMALCFSLVWGAHAVQAQEDHTLVLQLENYQEV  
ORF5\_23FTW -----MTMQMKQKMISRIFFVMALCFSLVWGAHAVQAQEDHTLVLQLENYQEV  
ORF5\_9VSP MTMQMKQKMISRIFFVMALCFSLVWGAHAVQAQEDHTLVLQLENYQEV  
ORF5\_23FP -----MTMQMKQKMISRIFFVMALCFSLVWGAHAVQAQEDHTLVLQLENYQEV  
\*\*\*\*\*

ORF5\_6BSP VSQLP SRDGHRLQVWKLDDSYSDRRVQIVRDLHSDENKLSSEFKKTSFEMTFLENQIEV  
ORF5\_TIGR VSQLP SRDGHRLQVWKLDDSYSDRRVQIVRDLHSDENKLSSEFKKTSFEMTFLENQIEV  
ORF5\_6BF VSQLP SRDGHRLQVWKLDDSYSDRRVQIVRDLHSDENKLSSEFKKTSFEMTFLENQIEV  
ORF5\_670 VSQLP SRDGHRLQVWKLDDSYSDRRVQIVRDLHSDENKLSSEFKKTSFEMTFLENQIEV  
ORF5\_19AH VSQLP SRDGHRLQVWKLDDSYSDRRVQIVRDLHSDENKLSSEFKKTSFEMTFLENQIEV  
ORF5\_14CSR VSQLP SRDGHRLQVWKLDDSYSDRRVQIVRDLHSDENKLSSEFKKTSFEMTFLENQIEV  
ORF5\_19FTW VSQLP SRDGHRLQVWKLDDSYSDNRVQIVRDLHSDENKLSSEFKKTSFEMTFLENQIEV  
ORF5\_23FTW VSQLP SRDGHRLQVWKLDDSYSDNRVQIVRDLHSDENKLSSEFKKTSFEMTFLENQIEV  
ORF5\_9VSP VSQLP SRDGHRLQVWKLDDSYSDNRVQIVRDLHSDENKLSSEFKKTSFEMTFLENQIEV  
ORF5\_23FP VSQLP SRDGHRLQVWKLDDSYSDNRVQIVRDLHSDENKLSSEFKKTSFEMTFLENQIEV  
\*\*\*\*\*

ORF5\_6BSP SHIPNGLYYVRSIIQTDVASYPAEFLFEMTDQTVPLVIVAKKTDMTTKVKLIKVDQDH  
ORF5\_TIGR SHIPNGLYYVRSIIQTDVASYPAEFLFEMTDQTVPLVIVAKKTDMTTKVKLIKVDQDH  
ORF5\_6BF SHIPNGLYYVRSIIQTDVASYPAEFLFEMTDQTVPLVIVAKKTDMTTKVKLIKVDQDH  
ORF5\_670 SHIPNGLYYVRSIIQTDVASYPAEFLFEMTDQTVPLVIVAKKTDMTTKVKLIKVDQDH  
ORF5\_19AH SHIPNGLYYVRSIIQTDVASYPAEFLFEMTDQTVPLVIVAKKTDMTTKVKLIKVDQDH  
ORF5\_14CSR SHIPNGLYYVRSIIQTDVASYPAEFLFEMTDQTVPLVIVAKKADTVTTKVKLIKVDQDH  
ORF5\_19FTW SHIPNGLYYVRSIIQTDVASYPAEFLFEMTDQTVPLVIVAKKADTVTTKVKLIKVDQDH  
ORF5\_23FTW SHIPNGLYYVRSIIQTDVASYPAEFLFEMTDQTVPLVIVAKKADTVTTKVKLIKVDQDH  
ORF5\_9VSP SHIPNGLYYVRSIIQTDVASYPAEFLFEMTDQTVPLVIVAKKADTVTTKVKLIKVDQDH  
ORF5\_23FP SHIPNGLYYVRSIIQTDVASYPAEFLFEMTDQTVPLVIVAKKADTVTTKVKLIKVDQDH  
\*\*\*\*\*

ORF5\_6BSP NRLEGVGFKLVSVARDGSEKEVPLIGEYRYSSSGQVGRITLYTDKNGEIVFTNLPLGNRYF  
ORF5\_TIGR NRLEGVGFKLVSVARDVSEKEVPLIGEYRYSSSGQVGRITLYTDKNGEIVFTNLPLGNRYF  
ORF5\_6BF NRLEGVGFKLVSVARDGSEKEVPLIGEYRYSSSGQVGRITLYTDKNGEIVFTNLPLGNRYF  
ORF5\_670 NRLEGVGFKLVSVARDGSEKEVPLIGEYRYSSSGQVGRITLYTDKNGEIVFTNLPLGNRYF  
ORF5\_19AH NRLEGVGFKLVSVARDGSEKEVPLIGEYRYSSSGQVGRITLYTDKNGEIVFTNLPLGNRYF  
ORF5\_14CSR NRLEGVGFKLVSVARDGSEKEVPLIGEYRYSSSGQVGRITLYTDKNGEIVFTNLPLGNRYF  
ORF5\_19FTW NRLEGVGFKLVSVARDGSEKEVPLIGEYRYSSSGQVGRITLYTDKNGEIVFTNLPLGTYRF  
ORF5\_23FTW NRLEGVGFKLVSVARDGSEKEVPLIGEYRYSSSGQVGRITLYTDKNGEIVFTNLPLGTYRF  
ORF5\_9VSP NRLEGVGFKLVSVARDGSEKEVPLIGEYRYSSSGQVGRITLYTDKNGEIVFTNLPLGTYRF  
ORF5\_23FP NRLEGVGFKLVSVARDGSEKEVPLIGEYRYSSSGQVGRITLYTDKNGEIVFTNLPLGTYRF  
\*\*\*\*\*

ORF5\_6BSP KEVEPLAGYAVTTLDTDVQLVDHQLVTITVVNQKLPRGNVDFMKVDGRTNTSLQGAMFKV  
ORF5\_TIGR KEVEPLAGYAVTTLDTDVQLVDHQLVTITVVNQKLPRGNVDFMKVDGRTNTSLQGAMFKV  
ORF5\_6BF KEVEPLAGYAVTTLDTDVQLVDHQLVTITVVNQKLPRGNVDFMKVDGRTNTSLQGAMFKV  
ORF5\_670 KEVEPLAGYAVTTLDTDVQLVDHQLVTITVVNQKLPRGNVDFMKVDGRTNTSLQGAMFKV  
ORF5\_19AH KEVEPLAGYAVTTLDTDVQLVDHQLVTITVVNQKLPRGNVDFMKVDGRTNTSLQGAMFKV  
ORF5\_14CSR KEVEPLAGYAVTTLDTDVQLVDHQLVTITVVNQKLPRGNVDFMKVDGRTNTSLQGAMFKV  
ORF5\_19FTW KEVEPLAGYAVTTLDTDVQLVDHQLVTITVVNQKLPRGNVDFMKVDGRTNTSLQGAMFKV  
ORF5\_23FTW KEVEPLAGYAVTTLDTDVQLVDHQLVTITVVNQKLPRGNVDFMKVDGRTNTSLQGAMFKV  
ORF5\_9VSP KEVEPLAGYAVTTLDTDVQLVDHQLVTITVVNQKLPRGNVDFMKVDGRTNTSLQGAMFKV  
ORF5\_23FP KEVEPLAGYAVTTLDTDVQLVDHQLVTITVVNQKLPRGNVDFMKVDGRTNTSLQGAMFKV  
\*\*\*\*\*

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## Figure 144B

```
ORF5_6BSP      MKEESGHYTPVLQNGKEVVVTSGKDGRFRVEGLE YGT  LWELOAPTCGVQLTSPVSFTI
ORF5_TIGR      MKEESGHYTPVLQNGKEVVVTSGKDGRFRVEGLE YGT  LWELOAPTCGVQLTSPVSFTI
ORF5_6BF       MKEESGHYTPVLQNGKEVVVTSGKDGRFRVEGLE YGT  LWELOAPTCGVQLTSPVSFTI
ORF5_670       MKEESGHYTPVLQNGKEVVVTSGKDGRFRVEGLE YGT  LWELOAPTCGVQLTSPVSFTI
ORF5_19AH      MKEESGHYTPVLQNGKEVVVTSGKDGRFRVEGLE YGT  LWELOAPTCGVQLTSPVSFTI
ORF5_14CSR     MKEESGHYTPVLQNGKEVVVTSGKDGRFRVEGLE YGT  LWELOAPTCGVQLTSPVSFTI
ORF5_19FTW     MKEENGHYTPVLQNGKEVVVSGKDGRFRVEGLE YGT  LWELOAPTCGVQLTSPVSFTI
ORF5_23FTW     MKEENGHYTPVLQNGKEVVVSGKDGRFRVEGLE YGT  LWELOAPTCGVQLTSPVSFTI
ORF5_9VSP      MKEENGHYTPVLQNGKEVVVSGKDGRFRVEGLE YGT  LWELOAPTCGVQLTSPVSFTI
ORF5_23FP      MKEENGHYTPVLQNGKEVVVSGKDGRFRVEGLE YGT  LWELOAPTCGVQLTSPVSFTI
*****
```

```
ORF5_6BSP      GKDTRKELVTVVKNNKRPRIDV P D T G E E T L Y I L M L V A I L L F G S G Y Y L T K K P N N
ORF5_TIGR      GKDTRKELVTVVKNNKRPRIDV P D T G E E T L Y I L M L V A I L L F G S G Y Y L T K K P N N
ORF5_6BF       GKDTRKELVTVVKNNKRPRIDV P D T G E E T L Y I L M L V A I L L F G S G Y Y L T K K P N N
ORF5_670       GKDTRKELVTVVKNNKRPRIDV P D T G E E T L Y I L M L V A I L L F G S G Y Y L T K K P N N
ORF5_19AH      GKDTRKELVTVVKNNKRPRIDV P D T G E E T L Y I L M L V A I L L F G S G Y Y L T K K P N N
ORF5_14CSR     GKDTRKELVTVVKNNKRPRIDV P D T G E E T L Y I L M L V A I L L F G S G Y Y L T K K P N N
ORF5_19FTW     GKDTRKELVTVVKNNKRPRIDV P D T G E E T L Y I L M L V A I L L F G S G Y Y L T K K T N N
ORF5_23FTW     GKDTRKELVTVVKNNKRPRIDV P D T G E E T L Y I L M L V A I L L F G S G Y Y L T K K T N N
ORF5_9VSP      GKDTRKELVTVVKNNKRPRIDV P D T G E E T L Y I L M L V A I L L F G S G Y Y L T K K T N N
ORF5_23FP      GKDTRKELVTVVKNNKRPRIDV P D T G E E T L Y I L M L V A I L L F G S G Y Y L T K K T N N
*****
```

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## Figure 145A

```
ORF6_23FTW      MLIKMKVTKKQKRNNLLLGVVFFFIGMAVMAYPLVSRLYYRVESNQQIADFDKEKATLDEA
ORF6_TIGR       MLIKMKVTKKQKRNNLLLGVVFFFIGMAVMAYPLVSRLYYRVESNQQIADFDKEKATLDEA
ORF6_6BSP       MLIKMKVTKKQKRNNLLLGVVFFFIGMAVMAYPLVSRLYYRVESNQQIADFDKEKATLDEA
ORF6_6BF        MLIKMKVTKKQKRNNLLLGVVFFFIGMAVMAYPLVSRLYYRVESNQQIADFDKEKATLDEA
ORF6_670        MLIKMKVTKKQKRNNLLLGVVFFFIGMAVMAYPLVSRLYYRVESNQQIADFDKEKATLDEA
ORF6_19AH       MLIKMKVTKKQKRNNLLLGVVFFFIGMAVMAYPLVSRLYYRVESNQQIADFDKEKATLDEA
ORF6_14CSR      MLIKMKVTKKQKRNNLLLGVVFFFIGMAVMAYPLVSRLYYRVESNQQIADFDKEKATLDEA
ORF6_23FP       MLIKMAKTKKQKRNNLLLGVVFFFIGIAVMAYPLVSRLYYRVESNQQIADFDKEKATLDEA
ORF6_9VSP       MLIKMAKTKKQKRNNLLLGVVFFFIGIAVMAYPLVSRLYYRVESNQQIADFDKEKATLDEA
ORF6_19FTW      MLIKMAKTKKQKRNNLLLGVVFFFIGMAVMAYPLVSRLYYRVESNQQIADFDKEKATLDEA
*****

ORF6_23FTW      DIDERMKLAQAFNDSLNNVSGDPWSEEMKKKGRAEYARMLEIHERMGHVEIPVIDVDLP
ORF6_TIGR       DIDERMKLAQAFNDSLNNVSGDPWSEEMKKKGRAEYARMLEIHERMGHVEIPVIDVDLP
ORF6_6BSP       DIDERMKLAQAFNDSLNNVSGDPWSEEMKKKGRAEYARMLEIHERMGHVEIPVIDVDLP
ORF6_6BF        DIDERMKLAQAFNDSLNNVSGDPWSEEMKKKGRAEYARMLEIHERMGHVEIPVIDVDLP
ORF6_670        DIDERMKLAQAFNDSLNNVSGDPWSEEMKKKGRAEYARMLEIHERMGHVEIPVIDVDLP
ORF6_19AH       DIDERMKLAQAFNDSLNNVSGDPWSEEMKKKGRAEYARMLEIHERMGHVEIPVIDVDLP
ORF6_14CSR      DIDERMKLAQAFNDSLNNVSGDPWSEEMKKKGRAEYARMLEIHERMGHVEIPVIDVDLP
ORF6_23FP       DIDERMKLAQAFNDSLNNVSGDPWSEEMKKKGRAEYARMLEIHERMGHVEIPVIDVDLP
ORF6_9VSP       DIDERMKLAQAFNDSLNNVSGDPWSEEMKKKGRAEYARMLEIHERMGHVEIPVIDVDLP
ORF6_19FTW      DIDERMKLAQAFNDSLNNVSGDPWSEEMKKKGRAEYARMLEIHERMGHVEIPVIDVDLP
*****

ORF6_23FTW      VYAGTAEVLQQGAGHLEGTSLPIGGNSTHAVITAHTGLPTAKMFTDLTKLVGDKFYVH
ORF6_TIGR       VYAGTAEVLQQGAGHLEGTSLPIGGNSTHAVITAHTGLPTAKMFTDLTKLVGDKFYVH
ORF6_6BSP       VYAGTAEVLQQGAGHLEGTSLPIGGNSTHAVITAHTGLPTAKMFTDLTKLVGDKFYVH
ORF6_6BF        VYAGTAEVLQQGAGHLEGTSLPIGGNSTHAVITAHTGLPTAKMFTDLTKLVGDKFYVH
ORF6_670        VYAGTAEVLQQGAGHLEGTSLPIGGNSTHAVITAHTGLPTAKMFTDLTKLVGDKFYVH
ORF6_19AH       VYAGTAEVLQQGAGHLEGTSLPIGGNSTHAVITAHTGLPTAKMFTDLTKLVGDKFYVH
ORF6_14CSR      VYAGTAEVLQQGAGHLEGTSLPIGGNSTHAVITAHTGLPTAKMFTDLTKLVGDKFYVH
ORF6_23FP       VYAGTAEVLQQGAGHLEGTSLPIGGNSTHAVITAHTGLPTAKMFTDLTKLVGDKFYVH
ORF6_9VSP       VYAGTAEVLQQGAGHLEGTSLPIGGNSTHAVITAHTGLPTAKMFTDLTKLVGDKFYVH
ORF6_19FTW      VYAGTAEVLQQGAGHLEGTSLPIGGNSTHAVITAHTGLPTAKMFTDLTKLVGDKFYVH
*****

ORF6_23FTW      NIKEVMAYQVDQVKVIEPTNFDDLLIVPGHDYVTLTCTPYMINTHRLVLRGHRIPYVAE
ORF6_TIGR       NIKEVMAYQVDQVKVIEPTNFDDLLIVPGHDYVTLTCTPYMINTHRLVLRGHRIPYVAE
ORF6_6BSP       NIKEVMAYQVDQVKVIEPTNFDDLLIVPGHDYVTLTCTPYMINTHRLVLRGHRIPYVAE
ORF6_6BF        NIKEVMAYQVDQVKVIEPTNFDDLLIVPGHDYVTLTCTPYMINTHRLVLRGHRIPYVAE
ORF6_670        NIKEVMAYQVDQVKVIEPTNFDDLLIVPGHDYVTLTCTPYMINTHRLVLRGHRIPYVAE
ORF6_19AH       NIKEVMAYQVDQVKVIEPTNFDDLLIVPGHDYVTLTCTPYMINTHRLVLRGHRIPYVAE
ORF6_14CSR      NIKEVMAYQVDQVKVIEPTNFDDLLIVPGHDYVTLTCTPYMINTHRLVLRGHRIPYVAE
ORF6_23FP       NIKEVMAYQVDQVKVIEPTNFDDLLIVPGHDYVTLTCTPYMINTHRLVLRGHRIPYVAE
ORF6_9VSP       NIKEVMAYQVDQVKVIEPTNFDDLLIVPGHDYVTLTCTPYMINTHRLVLRGHRIPYVAE
ORF6_19FTW      NIKEVMAYQVDQVKVIEPTNFDDLLIVPGHDYVTLTCTPYMINTHRLVLRGHRIPYVAE
*****

ORF6_23FTW      VEEEFIAANKLSHLYRYLFYVAVGLIVILLWIIRRLRKKKKQPEKALKALKAAARKEVKVE
ORF6_TIGR       VEEEFIAANKLSHLYRYLFYVAVGLIVILLWIIRRLRKKKKQPEKALKALKAAARKEVKVE
ORF6_6BSP       VEEEFIAANKLSHLYRYLFYVAVGLIVILLWIIRRLRKKKKQPEKALKALKAAARKEVKVE
ORF6_6BF        VEEEFIAANKLSHLYRYLFYVAVGLIVILLWIIRRLRKKKKQPEKALKALKAAARKEVKVE
ORF6_670        VEEEFIAANKLSHLYRYLFYVAVGLIVILLWIIRRLRKKKKQPEKALKALKAAARKEVKVE
ORF6_19AH       VEEEFIAANKLSHLYRYLFYVAVGLIVILLWIIRRLRKKKKQPEKALKALKAAARKEVKVE
ORF6_14CSR      VEEEFIAANKLSHLYRYLFYVAVGLIVILLWIIRRLRKKKKQPEKALKALKAAARKEVKVE
ORF6_23FP       VEEEFIAANKLSHLYRYLFYVAVGLIVILLWIIRRLRKKKKQSERALKALKEATKEVKVE
ORF6_9VSP       VEEEFIAANKLSHLYRYLFYVAVGLIVILLWIIRRLRKKKKQSERALKALKEATKEVKVE
ORF6_19FTW      VEEEFIAANKLSHLYRYLFYVAVGLIVILLWIIRRLRKKKKQSERALKALKEATKEVKVE
*****
```

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## Figure 145B

ORF6_23FTW	DGQQ
ORF6_TIGR	DGQQ
ORF6_6BSP	DGQQ
ORF6_6BF	DGQQ
ORF6_670	DGQQ
ORF6_19AH	DGQQ
ORF6_14CSR	DGQQ
ORF6_23FP	DE--
ORF6_9VSP	DE--
ORF6_19FTW	DE--



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[illegible]

```

ORF8_14CSR      MSKAKLQKLLGYLLMLVALVIPVYCFGQMVLQSLGQVKGHEIFSESVTADSYQEQLQRS
ORF8_19AH      MSKAKLQKLLGYLLMLVALVIPVYCFGQMVLQSLGQVKGHEIFSESVTADSYQEQLQRS
ORF8_23FTW     MSKAKLQKLLGYLLMLVALVIPVYCFGQMVLQSLGQVKGHEIFSESVTADSYQEQLQRS
ORF8_670       MSKAKLQKLLGYLLMLVALVIPVYCFGQMVLQSLGQVKGHEIFSESVTADSYQEQLQRS
ORF8_6BF       MSKAKLQKLLGYLLMLVALVIPVYCFGQMVLQSLGQVKGHEIFSESVTADSYQEQLQRS
ORF8_6BSP      MSKAKLQKLLGYLLMLVALVIPVYCFGQMVLQSLGQVKGHEIFSESVTADSYQEQLQRS
ORF8_19FTW     MSRTKLRALLGYLLMLVACLIPIYCFGQMVLQSLGQVKGHATFVKSMTEMYQEQQNHS
ORF8_23FP      MSRTKLRALLGYLLMLVACLIPIYCFGQMVLQSLGQVKGHATFVKSMTEMYQEQQNHS
ORF8_9VSP      MSRTKLRALLGYLLMLVACLIPIYCFGQMVLQSLGQVKGHATFVKSMTEMYQEQQNHS
ORF8_TIGR      MSRTKLRALLGYLLMLVACLIPIYCFGQMVLQSLGQVKGHATFVKSMTEMYQEQQNHS
                **:.*: ***** :*:*****  * :*.*: **** :.*
ORF8_14CSR      DYNQRLDSQNRIVDPFLAEGYEVNYQVSDPPDAVYGYLSIPSLEIMEPVYLGADYHHLAM
ORF8_19AH      DYNQRLDSQNRIVDPFLAEGYEVNYQVSDPPDAVYGYLSIPSLEIMEPVYLGADYHHLAM
ORF8_23FTW     DYNQRLDSQNRIVDPFLAEGYEVNYQVSDPPDAVYGYLSIPSLEIMEPVYLGADYHHLAM
ORF8_670       DYNQRLDSQNRIVDPFLAEGYEVNYQVSDPPDAVYGYLSIPSLEIMEPVYLGADYHHLAM
ORF8_6BF       DYNQRLDSQNRIVDPFLAEGYEVNYQVSDPPDAVYGYLSIPSLEIMEPVYLGADYHHLAM
ORF8_6BSP      DYNQRLDSQNRIVDPFLAEGYEVNYQVSDPPDAVYGYLSIPSLEIMEPVYLGADYHHLAM
ORF8_19FTW     AYNQRLASQNRIVDPFLAEGYEVNYQVSDPPDAVYGYLSIPSLEIMEPVYLGADYHHLGM
ORF8_23FP      AYNQRLASQNRIVDPFLAEGYEVNYQVSDPPDAVYGYLSIPSLEIMEPVYLGADYHHLGM
ORF8_9VSP      AYNQRLASQNRIVDPFLAEGYEVNYQVSDPPDAVYGYLSIPSLEIMEPVYLGADYHHLGM
ORF8_TIGR      AYNQRLASQNRIVDPFLAEGYEVNYQVSDPPDAVYGYLSIPSLEIMEPVYLGADYHHLGM
                *****
ORF8_14CSR      GLAHVDGTPLPVEGKGIRSVIAGHRAEPSHVFFRHLDDLQKVGDALYDNGQEIVEYQMMMD
ORF8_19AH      GLAHVDGTPLPVEGKGIRSVIAGHRAEPSHVFFRHLDDLQKVGDALYDNGQEIVEYQMMMD
ORF8_23FTW     GLAHVDGTPLPVEGKGIRSVIAGHRAEPSHVFFRHLDDLQKVGDALYDNGQEIVEYQMMMD
ORF8_670       GLAHVDGTPLPVEGKGIRSVIAGHRAEPSHVFFRHLDDLQKVGDALYDNGQEIVEYQMMMD
ORF8_6BF       GLAHVDGTPLPVEGKGIRSVIAGHRAEPSHVFFRHLDDLQKVGDALYDNGQEIVEYQMMMD
ORF8_6BSP      GLAHVDGTPLPVEGKGIRSVIAGHRAEPSHVFFRHLDDLQKVGDALYDNGQEIVEYQMMMD
ORF8_19FTW     GLAHVDGTPLPLDGTGIRSVIAGHRAEPSHVFFRHLDDLQKVGDALYDNGQEIVEYQMMMD
ORF8_23FP      GLAHVDGTPLPLDGTGIRSVIAGHRAEPSHVFFRHLDDLQKVGDALYDNGQEIVEYQMMMD
ORF8_9VSP      GLAHVDGTPLPLDGTGIRSVIAGHRAEPSHVFFRHLDDLQKVGDALYDNGQEIVEYQMMMD
ORF8_TIGR      GLAHVDGTPLPLDGTGIRSVIAGHRAEPSHVFFRHLDDLQKVGDALYDNGQEIVEYQMMMD
                *****:.*.*****
ORF8_14CSR      TEIILPSEWEKLESVSSKNIMTLITCDPIPTFNKRLLVNFERVAVYQKSDPQTAABARVA
ORF8_19AH      TEIILPSEWEKLESVSSKNIMTLITCDPIPTFNKRLLVNFERVAVYQKSDPQTAABARVA
ORF8_23FTW     TEIILPSEWEKLESVSSKNIMTLITCDPIPTFNKRLLVNFERVAVYQKSDPQTAABARVA
ORF8_670       TEIILPSEWEKLESVSSKNIMTLITCDPIPTFNKRLLVNFERVAVYQKSDPQTAABARVA
ORF8_6BF       TEIILPSEWEKLESVSSKNIMTLITCDPIPTFNKRLLVNFERVAVYQKSDPQTAABARVA
ORF8_6BSP      TEIILPSEWEKLESVSSKNIMTLITCDPIPTFNKRLLVNFERVAVYQKSDPQTAABARVA
ORF8_19FTW     TEIILPSEWEKLESVSSKNIMTLITCDPIPTFNKRLLVNFERVAVYQKSDPQTAABARVA
ORF8_23FP      TEIILPSEWEKLESVSSKNIMTLITCDPIPTFNKRLLVNFERVAVYQKSDPQTAABARVA
ORF8_9VSP      TEIILPSEWEKLESVSSKNIMTLITCDPIPTFNKRLLVNFERVAVYQKSDPQTAABARVA
ORF8_TIGR      TEIILPSEWEKLESVSSKNIMTLITCDPIPTFNKRLLVNFERVAVYQKSDPQTAABARVA
                *****
ORF8_14CSR      FTKEGQSVSRVATSQWLYRGLVLAFLGILFVLWKLARLLRGK
ORF8_19AH      FTKEGQSVSRVATSQWLYRGLVLAFLGILFVLWKLARLLRGK
ORF8_23FTW     FTKEGQSVSRVATSQWLYRGLVLAFLGILFVLWKLARLLRGK
ORF8_670       FTKEGQSVSRVATSQWLYRGLVLAFLGILFVLWKLARLLRGK
ORF8_6BF       FTKEGQSVSRVATSQWLYRGLVLAFLGILFVLWKLARLLRGK
ORF8_6BSP      FTKEGQSVSRVATSQWLYRGLVLAFLGILFVLWKLARLLRGK
ORF8_19FTW     FTKEGQSVSRVATSQWLYRGLVLAFLGILFVLWKLARLLRGK
ORF8_23FP      FTKEGQSVSRVATSQWLYRGLVLAFLGILFVLWKLARLLRGK
ORF8_9VSP      FTKEGQSVSRVATSQWLYRGLVLAFLGILFVLWKLARLLRGK
ORF8_TIGR      FTKEGQSVSRVATSQWLYRGLVLAFLGILFVLWKLARLLRGK
                *****

```

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# RrgA, LPXTG

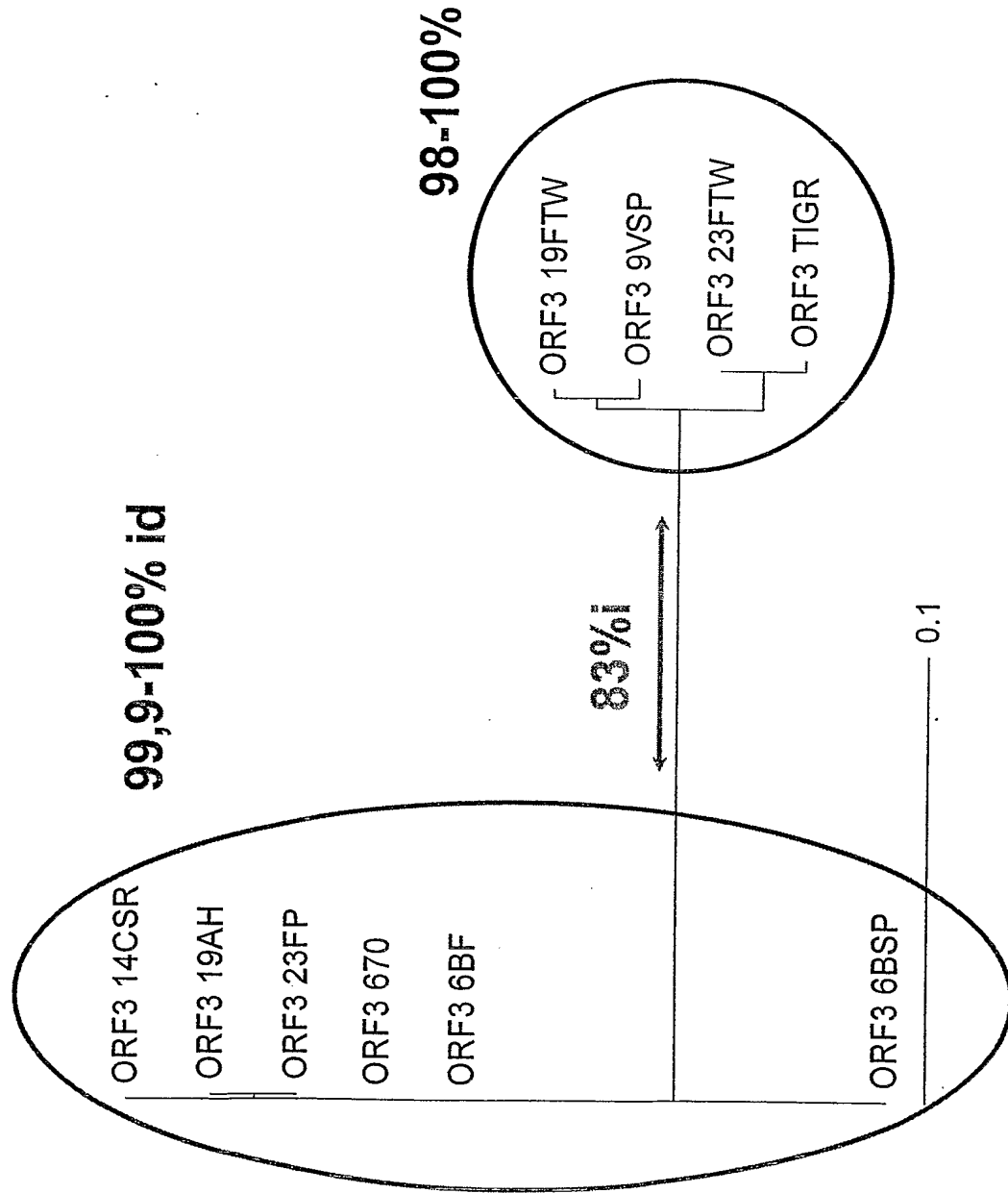


Figure 148

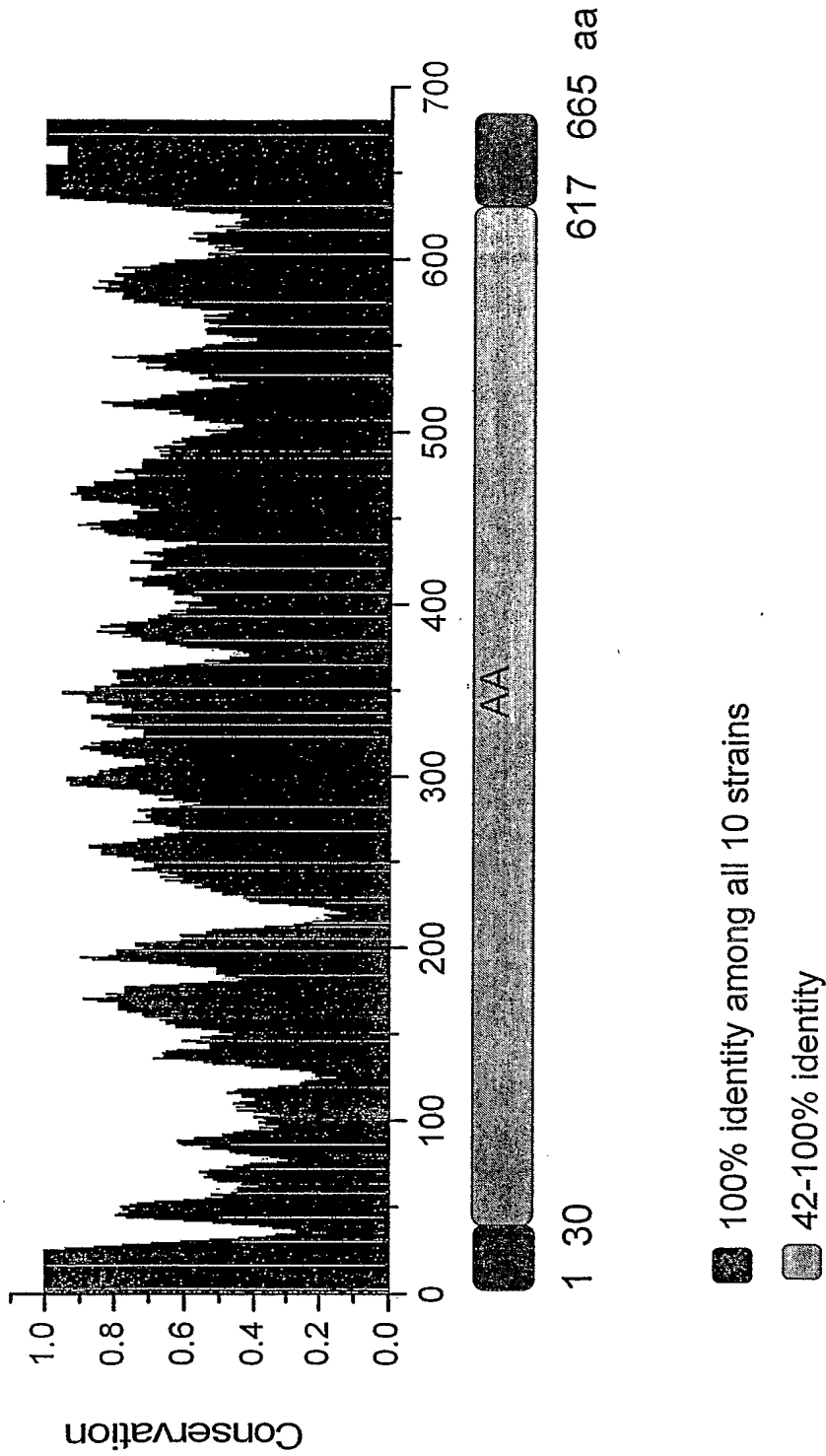


Figure 149

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A

MLNRETHMKVKRKFQKAVAGLCCISQLTAFSSIVALA\*ETPETS PAIGKVVIKETGEGGALLGDAVFELKN  
 NTDGTTVSQRTEAQTGEAIFSNIKPGTYTLTEAQQPVGYKPKSTKQWTVVEKNGRRTTVQGEQVENREE  
 ALSDQYPQGTGTYPDVQTPYQIIKVDGSEKNGQHKALNPYPYERVIPGTL SKRIYQVNNLDDNQYGIEL  
 TVSGKTVYEQDKSVPLDVVILLDNSMSNIRKNARRAERAGEATRSIDKITSSEN RVALV TYAS  
 TIFDGTFTVEKGVADKNGKRLNDSLFWNYDQTSFTTNTKDYSLKLTNDKNDIVELKNKVPTAEADHD  
 GNRLMYQFGATFTQKALMKADEILTQQAQNSQKVIFHITDGVPTMSYPINFNHA TFAPSYQNQLNA  
 FFSKSPNKDGILLSDFITQATSGEHTVVRGDGQSYQMFTDKTVYEKGAPAAFPVKPEKYSEMKAAGYAVI  
 GDPINGGYIWLNWRESILAYPFNSNTAKITNHGDPTRWYYNGNIAPDGYDVFTVGIGINGDPGTDEATA  
 TSFMQSISSKPENYTNVTDTTKILEQLNRYFHTIVTEKKSIE NGTITDPMGELIDLQLGTDGRFDPADYTL  
 TANDGSRLENGQAVGGPQNDGGLLKNAKVL YDTTEKRIRVTGL YLGTDEKVTLTYNVRLNDEFVSNKFYD  
 TNGRTTLHPKEVEQNTVRDFPKIRDVRKYPEITISKEKKGLDIEFKVKNKNDKKPLRGAVFSLQKQHPDYP  
 DIYGAIQNGTYQNVRTGEDGKLTfKNLSDGKYRLFENSEPAGYKPVQNKPIVAFQIVNGEVRDVT SIVPQ  
 DIPAGYEFTNDKHYYITNEP PPKREYPR TGGIGMLPFY LIGCMMMG VLLYTRKHP

B

5' cgggatcc-gaa-acg-cct-gaa-acc-agt 5' 24mer, 54 %G+C, Tm 62

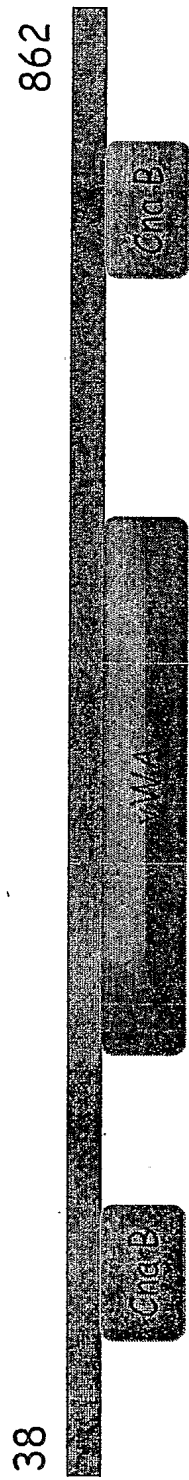
*Bam*HI

3' ccgctcgag-aat-agg-ttc-att-ggt 3' 27mer, 52 %G+C, Tm 61.6

*Xho*I

Figure 150

A.



B.

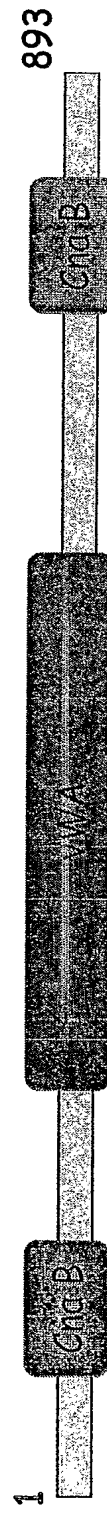
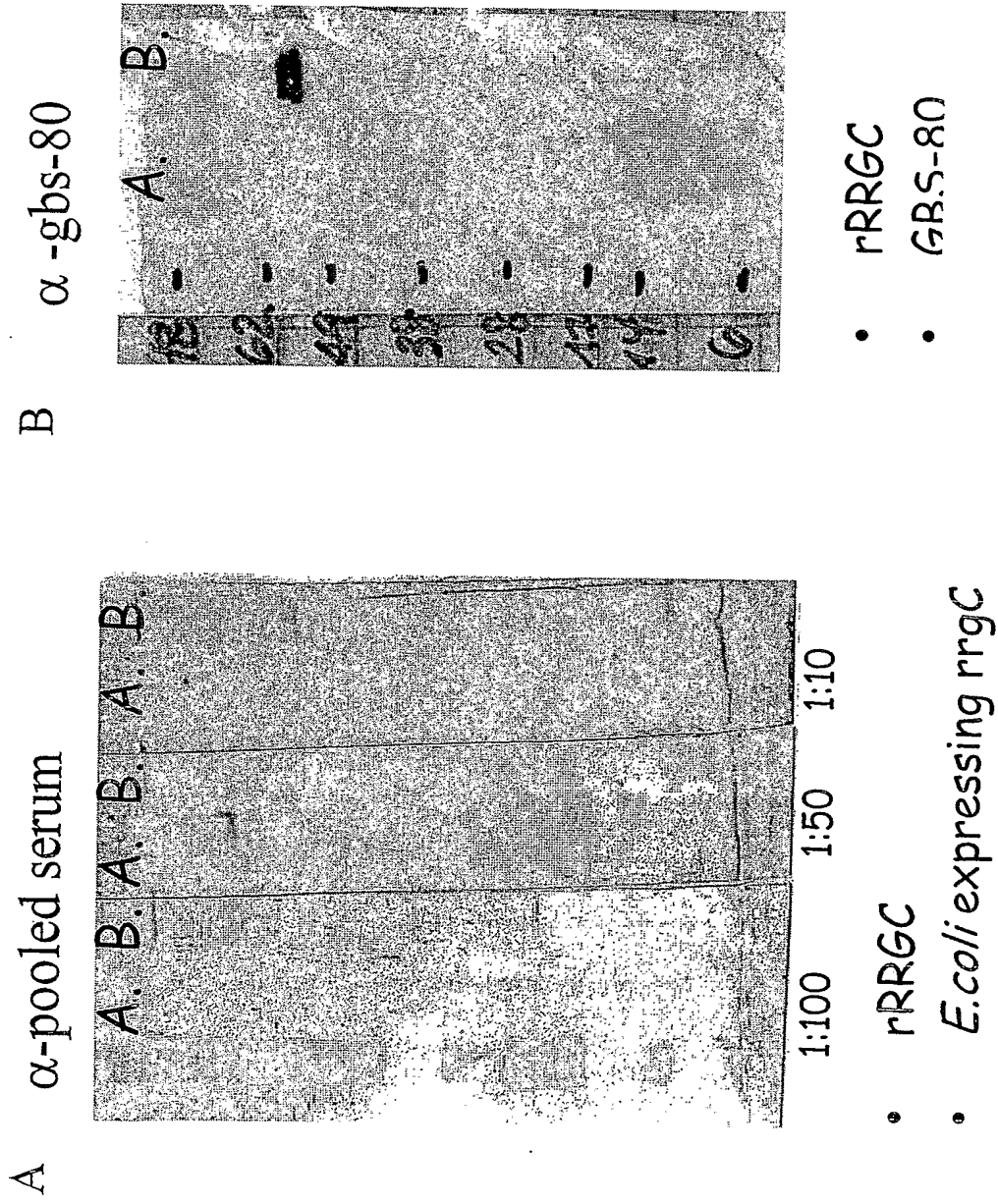


Figure 151

Figure 152





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A

MKSINKFLTMLAALLLTASSLS\* AATVFAAGTTTTSVTVHKLLATDGDMDKIANELETGNYAGNKVGVLP  
 NAKELAGVMFVWNTNNEIIDENGQTLGVNIDPQTFKLSGAMPATAMKKL TEAEGAKFNTANLPAAKYKIY  
 EHSLS TVVGEDGATLTGSKAVPIEIELPLNDVVDAHVYPKNTAKPKIDKDFKGKANPDTPRVDKDTPVNHQV  
 GDVVEYEIVTKIPALANYATANWSDRMTEGLAFNKGTVKVTVDDV ALEAGDYALTEVATGFDLKLTDAGLAK  
 VNDQNAEKT VKITYSATLNDKAIVEVPESNDVTFNYGNNPDHGNTPKNKPNENGDLTLTKTWV DATGAPIP  
 AGAEATFDLVNAQTGKV VQTVTLTDDKNTVTVNGLDKNT EYKFVRSIKGYSADYQEITTA GEIAVKNNWKD  
 ENPKPLDPTEPKVV TYGKKFVKVNDKDNRLAGAEFVIANADNAGQYLARKADKVSQEEKQLVVTTKDALDRAV  
 AAYNALTAQQQTQQEKEKVDKAQAAYNAAVLAANNAFEWVADKD NENVVKLVSDAQGRFEITGLLAGTY  
 YLEETKQPAGYALLTSRQKFEVTATSYSATGQGIEYTAGSGKDDATKVVNKKITIPQTGGIGTIFAVAGAAI  
 MGLAVYAYVKNKDEDEQLA

B

5' cgggatcc-gct-gca-aca-gtt-ttt 3' 23mer, 52.2% G+C, Tm 60.6  
*Bam*HI  
 5' ccgctcgcgag-agt-gat-ttt-ttt-gtt-gac 3' 26mer, 44.4% G+C, Tm 61.7  
*Xho*I

Figure 153

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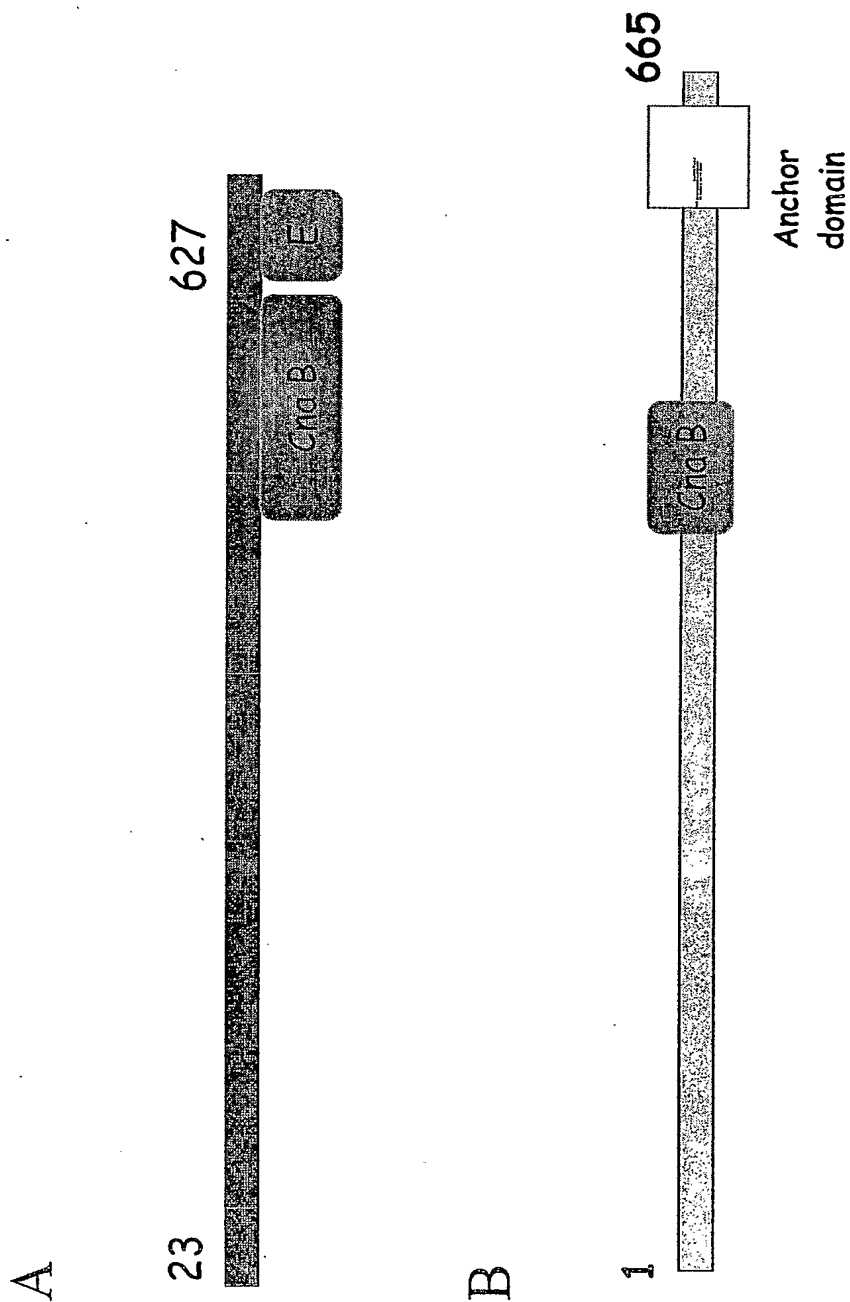


Figure 154

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60 kDa



Figure 155

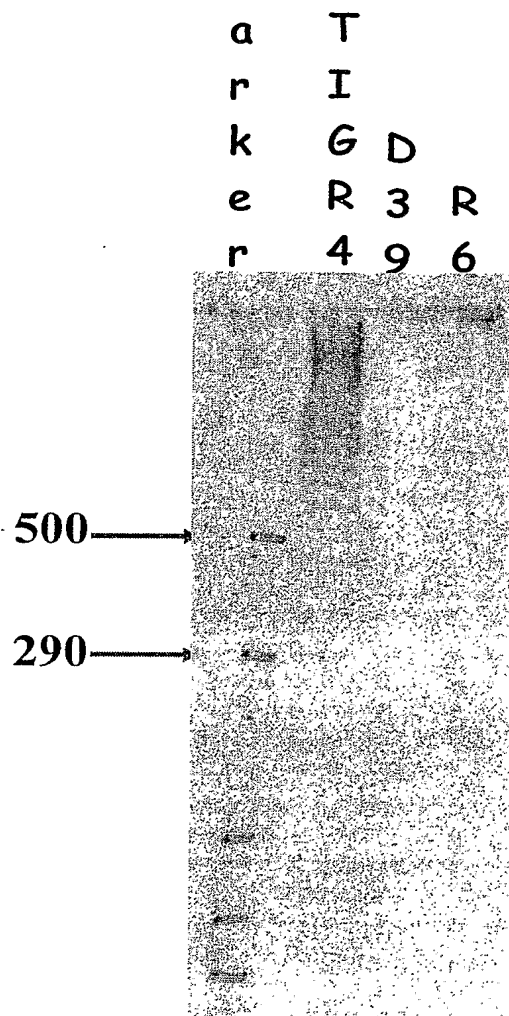


Figure 156

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A

MISRIFFV~~MALCFSLVWGA~~\*H~~AVOAE~~DHTLVLENYQEVVSQLPSRDGHR~~LQVWKL~~DDSYS  
 YDDR~~VQIVRDLHSW~~DENKLS~~FFKKT~~SFEMTFLENQIEVSHIPNGLYYVRSIQTD~~AVSYP~~AEFLF  
 EMTDQTV~~EPLVIVAKKTD~~MTTKV~~KLKVDQD~~HNRLEGVGF~~KLVS~~VAR~~DVSEKEV~~PLIGEYRYSS  
 GQVGR~~TL~~YTDKNGE~~IFVTNLPLGN~~YR~~FEKE~~VEPLAGYA~~VTTLD~~TDVQLVDH~~QLVT~~TTV~~VNQKL~~PRGN  
 VDFMKV~~DGR~~INTSLQ~~GAM~~FKVMKEESGHYTPVLQNGKEV~~VVTSGKDGRFR~~VEGLEYG~~TTYL~~WELQ  
 APTGYVQLTSPVSFTIGK~~DT~~RKELVT~~VVKNNKRP~~RDV~~PD~~TGEETLYILMLVAIL~~FGSGYYL~~TKKP  
 NN

B

5' cg~~ggatcc~~-cat-gtc-caa-gcg-caa-gaa 21mer, 61% G+C, Tm 60.8

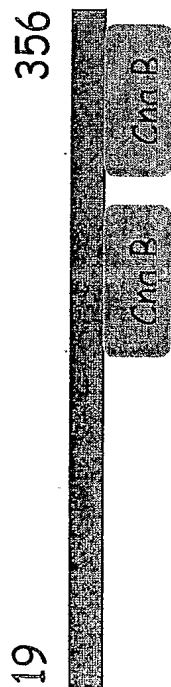
*Bam*HI

5' ccg~~ctcgag~~-ctt-gtt-att-ttt-aac-cac 27mer, 44% G+C, Tm 58.4

*Xho*I

Figure 157

A



B



Figure 158

PCT/US05/27239 357/487

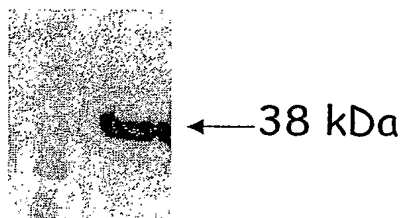


Figure 159



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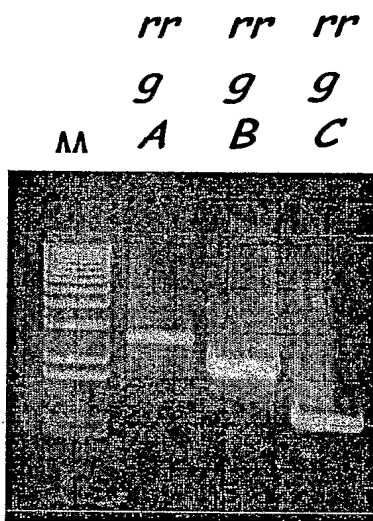
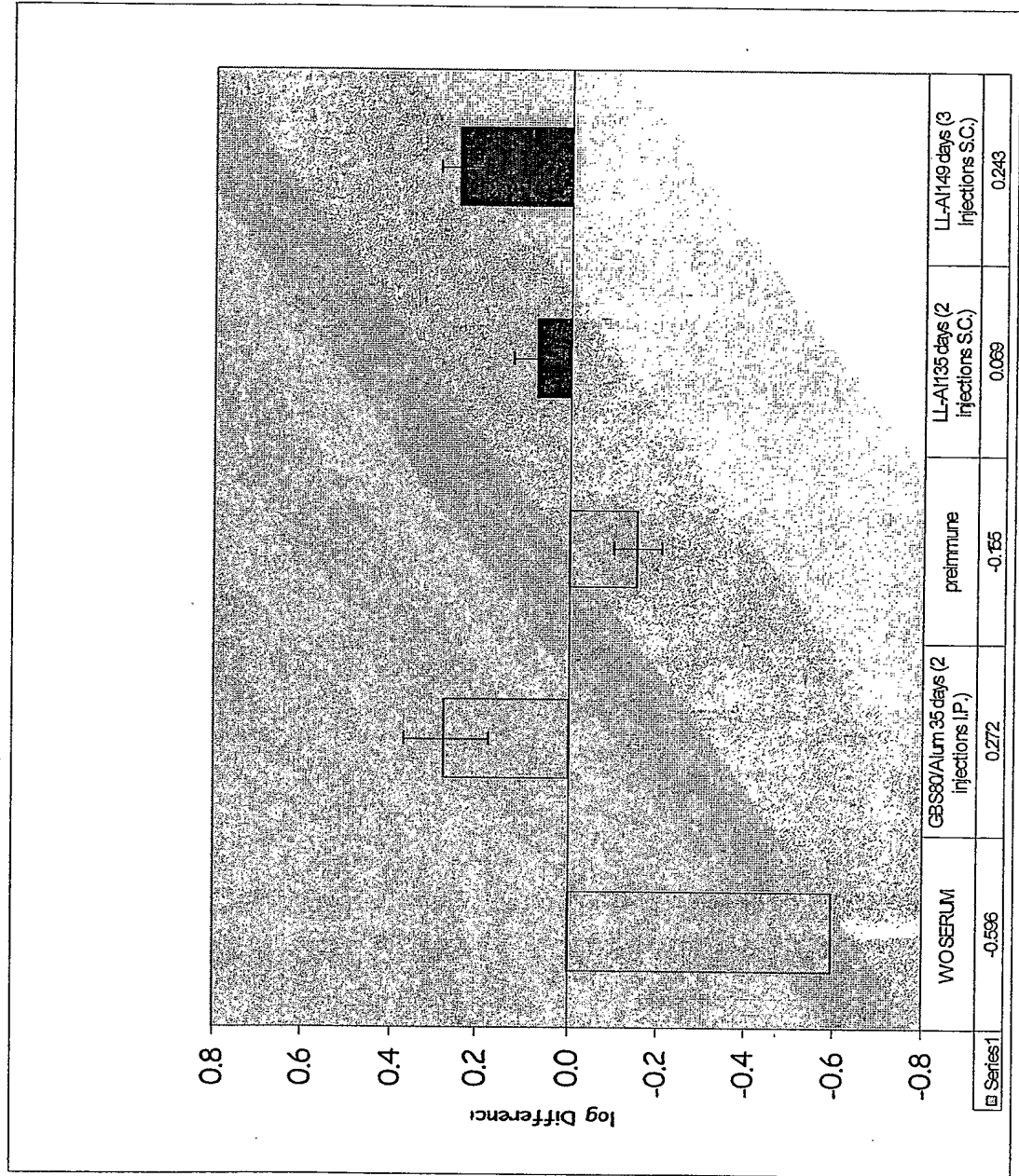


Figure 160

Figure 161



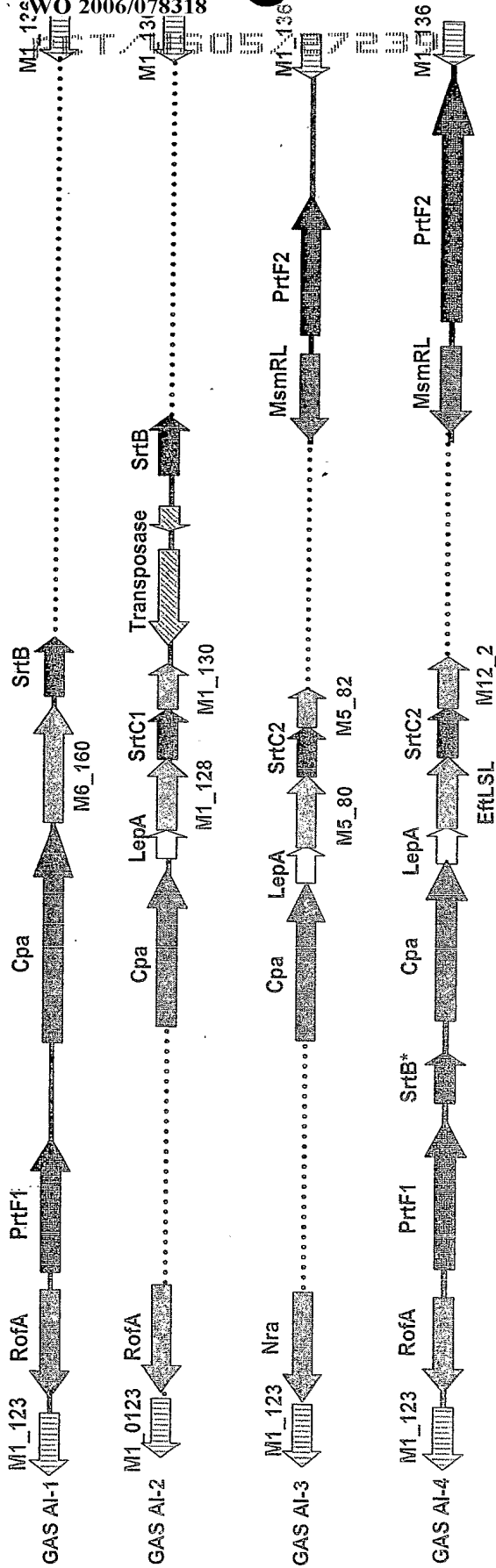
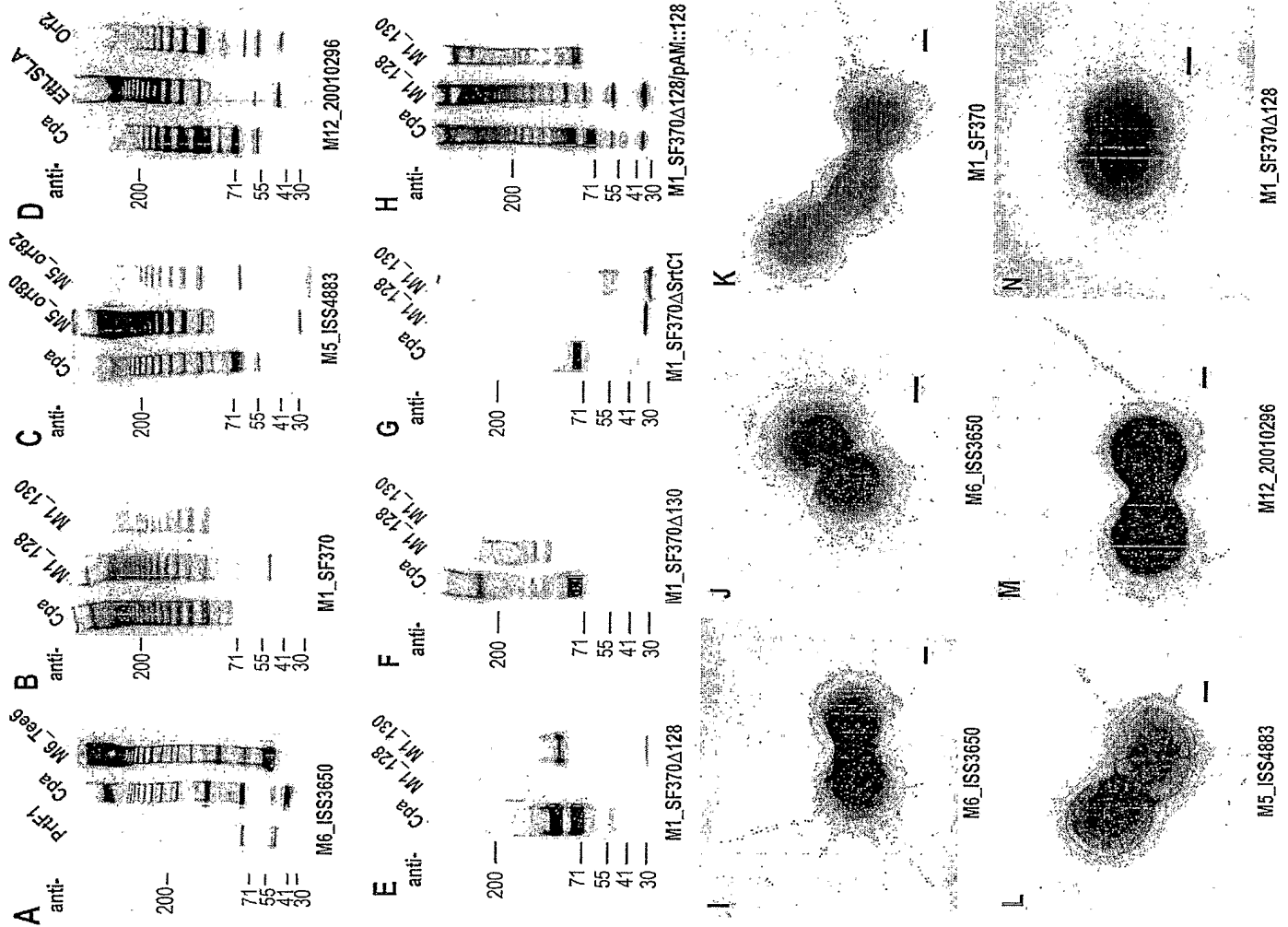


FIGURE 162

# Figure 163



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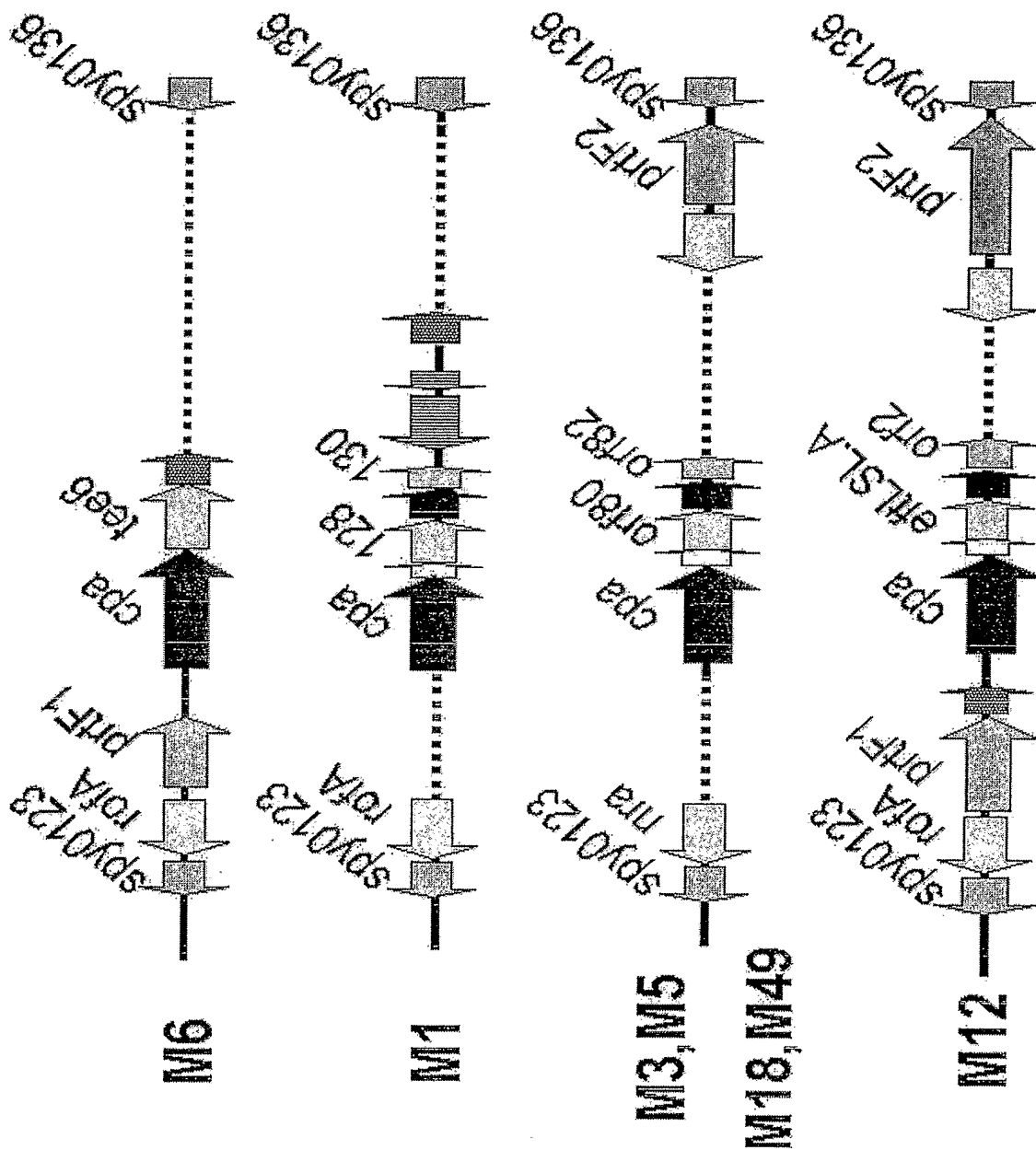


Figure 164

PCT/US05/27239363/487

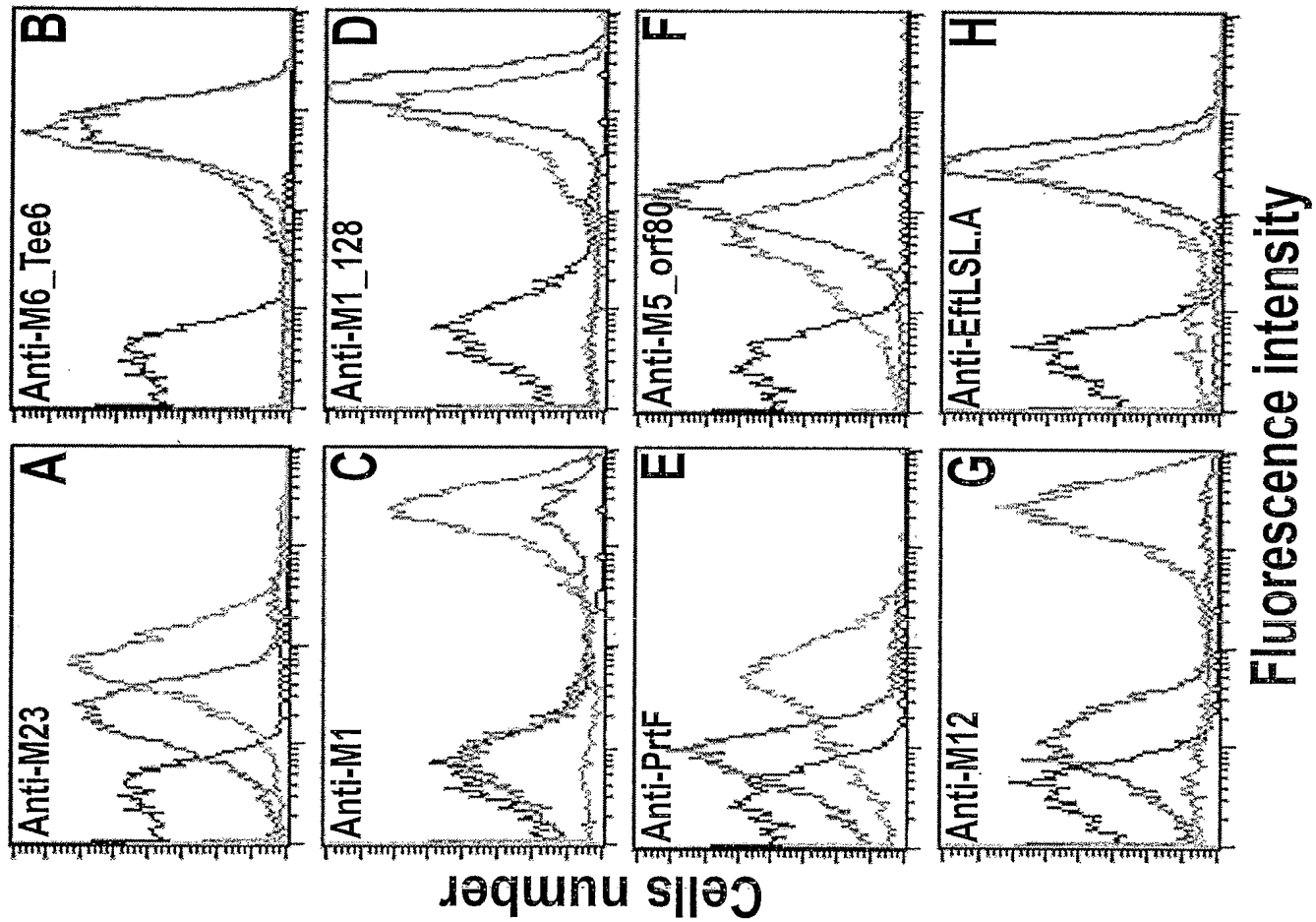


Figure 165

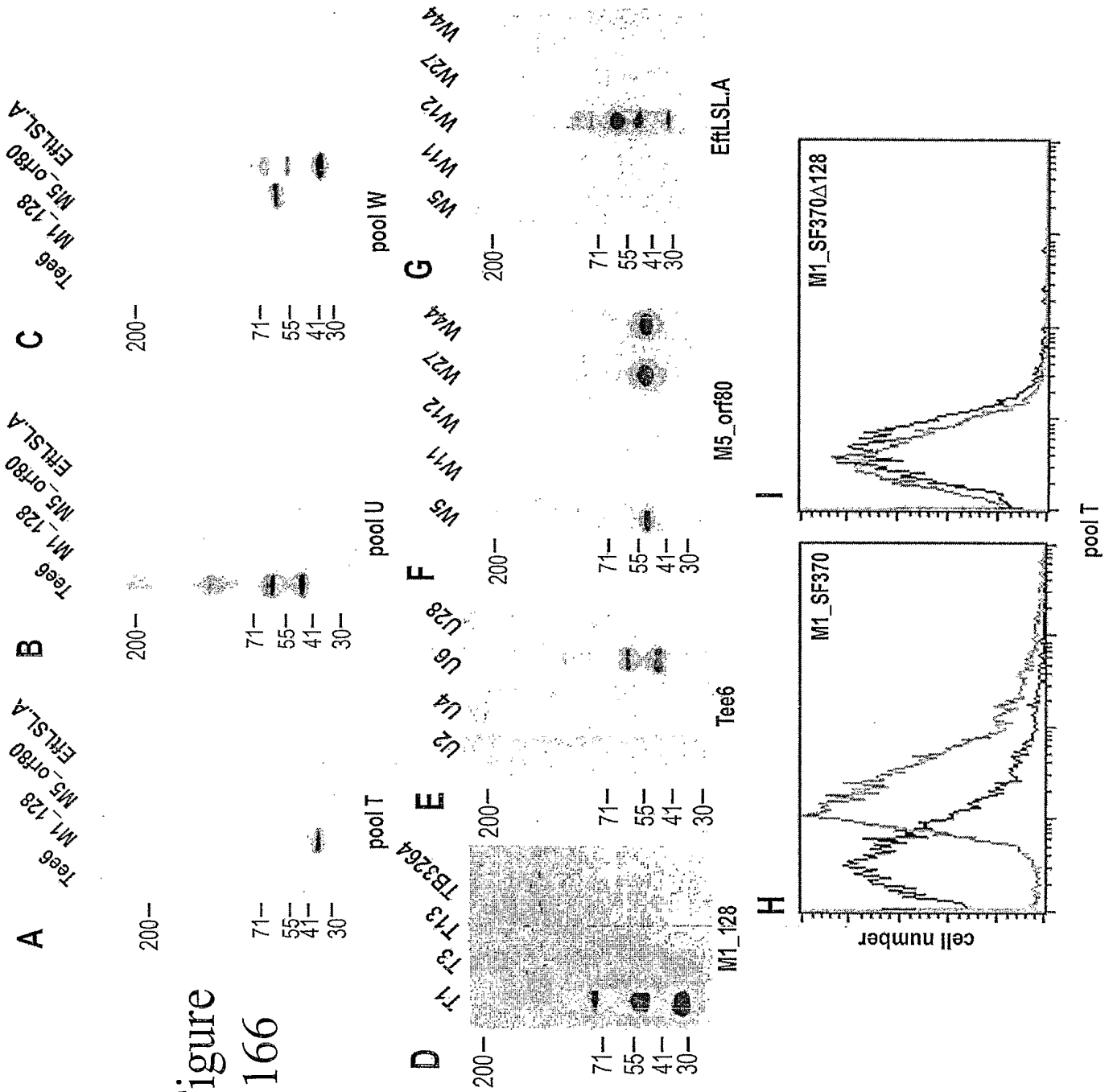




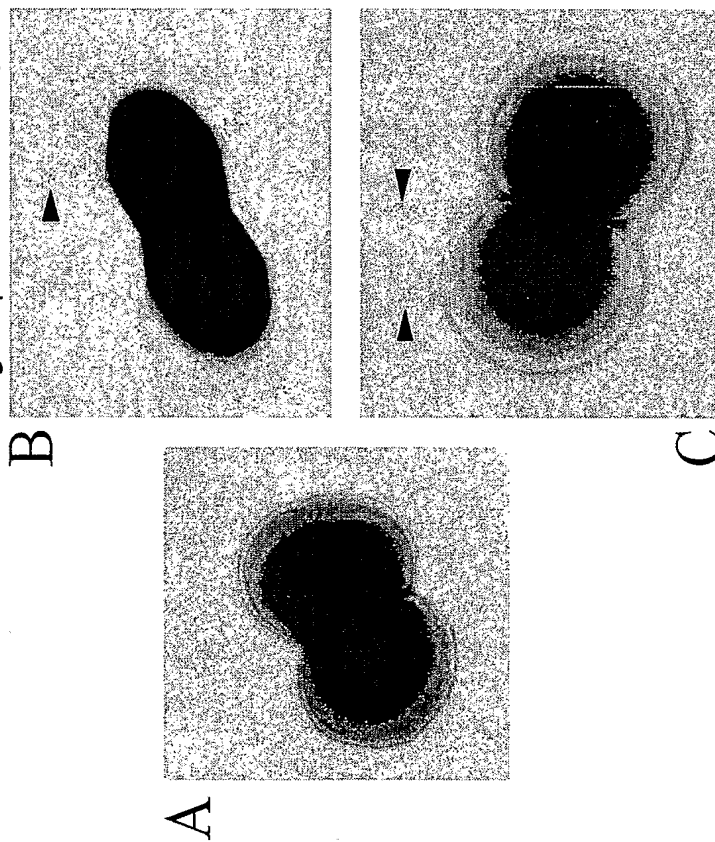
Figure 167

Strain	M-type	PCR					AI	Sequence
		SrtB	SrtC1	SrtC2	MsmRL	SipA2		
2724	6	+	-	-	-	-	1	
2894	6	+	-	-	-	-	1	
3650	6	+	-	-	-	-	1	
5529	6	+	-	-	-	-	1	
Dsm2071	23	+	-	-	-	-	1	+
SF370	1	+	+	-	-	-	2	literature
2580	1	+	+	-	-	-	2	
2913	1	+	+	-	-	-	2	
3280	1	+	+	-	-	-	2	
3348	1	+	+	-	-	-	2	
2719	?	+	+	-	-	-	2	
2721	3	-	-	+	+	+	3	
3040	3	-	-	+	+	+	3	
3135	3	-	-	+	+	+	3	
3776	44 ?	-	-	+	+	+	3	+
4959	77	-	-	+	+	+	3	+
4088	Clinical isolate	-	-	+	+	+	3	
2728	12	+	-	+	+	+	4	
2720	9	+	-	+	+	+	4	+
2727	11	+	-	+	+	+	4	+
4436	28	+	-	+	+	+	4	+
5481	44 ?	+	-	+	+	+	4	+
4538	50	+	-	+	+	+	4	+
3789	78	+	-	+	+	+	4	+
4883	5	+	-	+	+	+	4	
5476	89	+	-	+	+	+	4	
5495	?	+	-	+	+	+	4	
2722	4	-	-	-	-	-	?	
2723	5?	-	-	-	-	-	?	
2725	8	-	-	+	-	-	?	
2726	2	-	-	-	-	-	?	
2634	4	-	-	-	-	-	?	
5531	75	+	+	-	-	-	?	In progress

Figure 168

# Immuno-electronmicroscopy

(Immunogold Negative Staining,  
1°  $\alpha$  - 80, 2°  $\alpha$  - mouse gold particles 10nm )



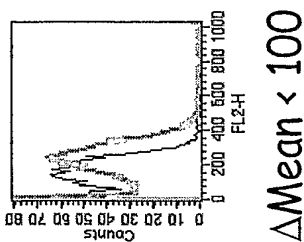
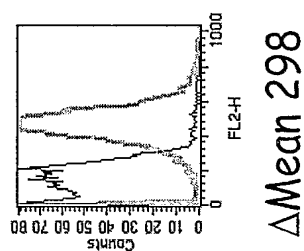
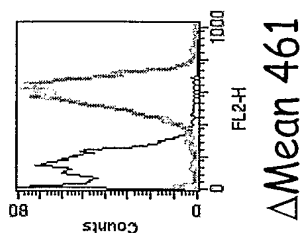
<i>L.lactis</i>	<i>L.lactis</i> + AI-1
-	+

Figure 169

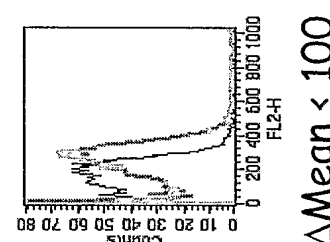
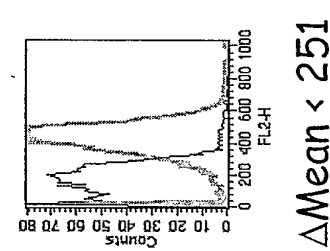
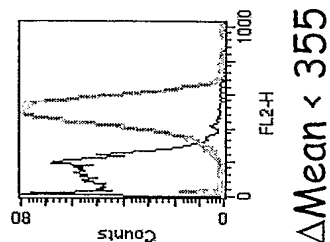
GBS JM9130013

*L. lactis* + AI-1

*L. lactis*



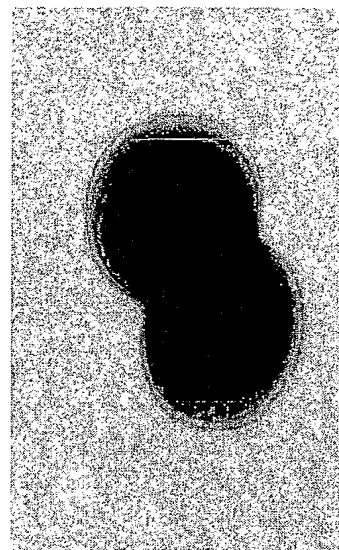
$\alpha$ -80



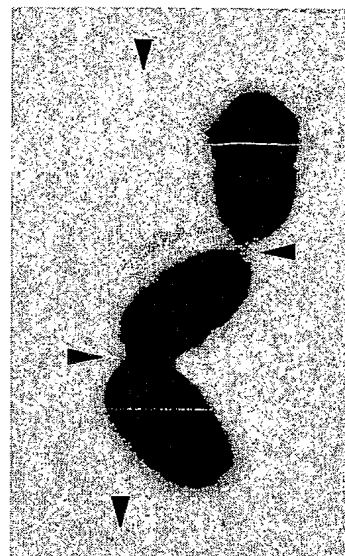
$\alpha$ -104

Figure 170

**Phase contrast Microscopy**      **Immuno-electronmicroscopy**  
 (Immunogold Negative Staining,  
 1°  $\alpha$ -80, 2°  $\alpha$ -mouse gold particles 10nm )



*L. lactis*

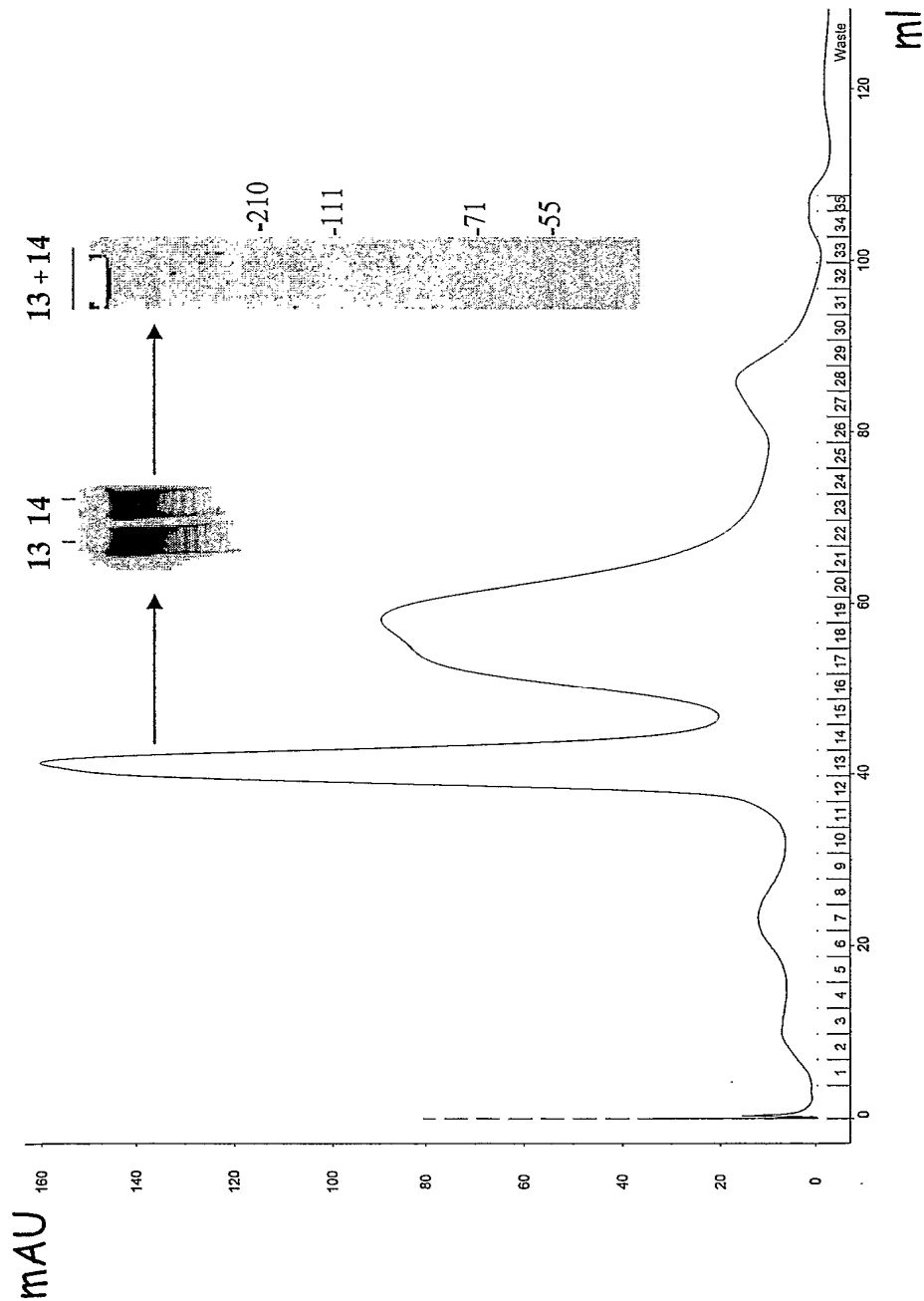


*L. lactis* + AI-1

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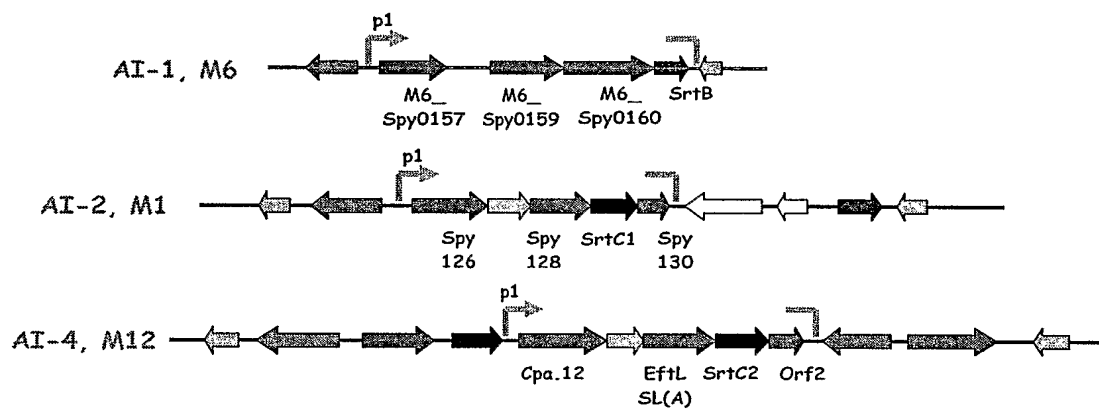
Figure 171

Gel filtration on Sepharyl HR 400

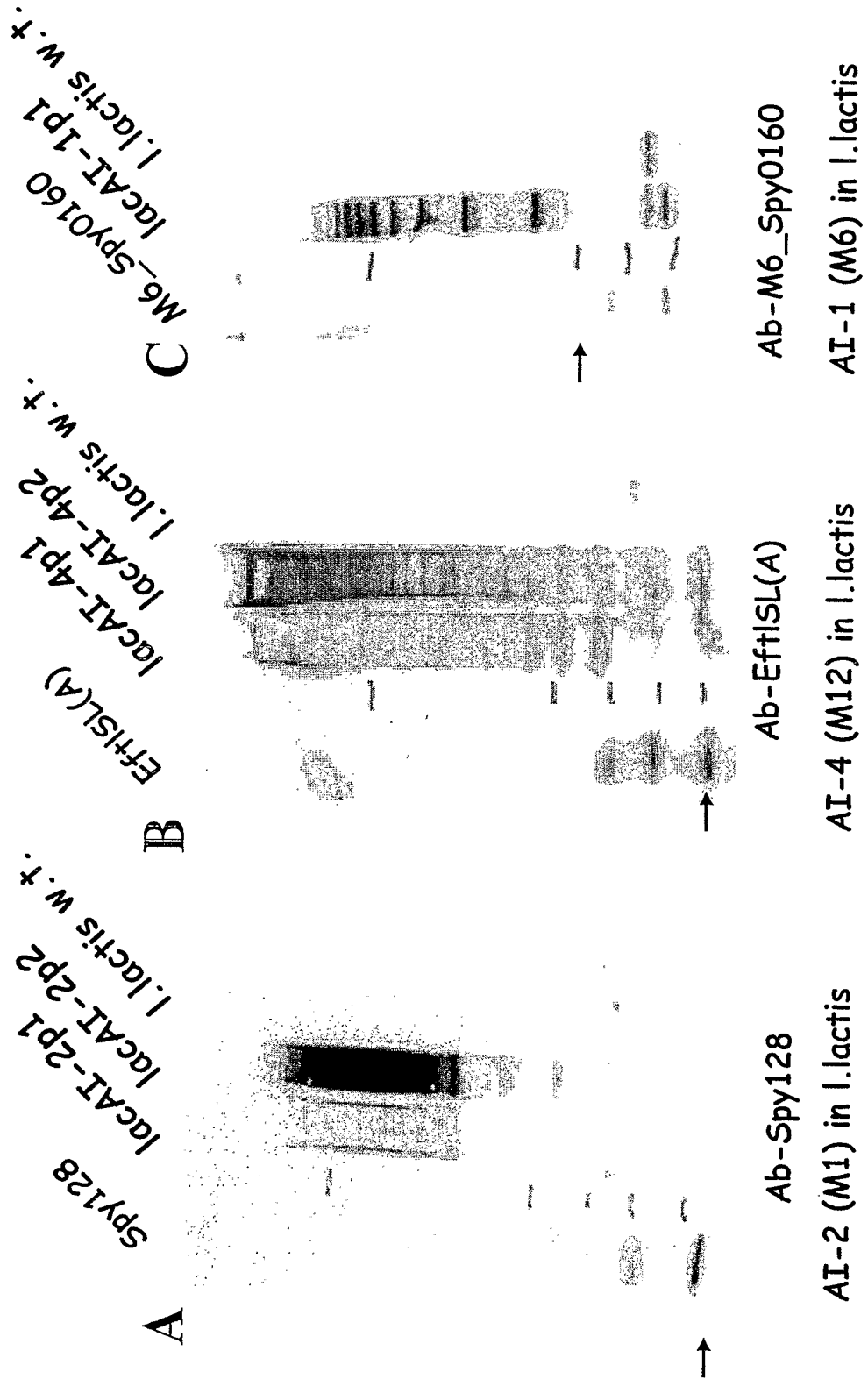


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Figure 172



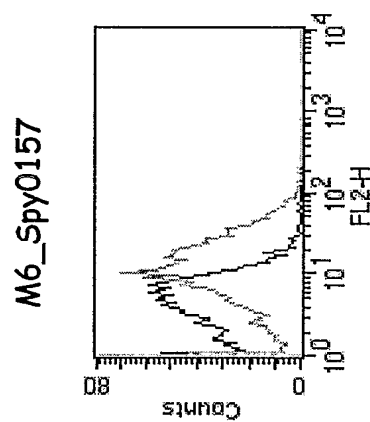
## Figure 173



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Figure 174





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Figure 175

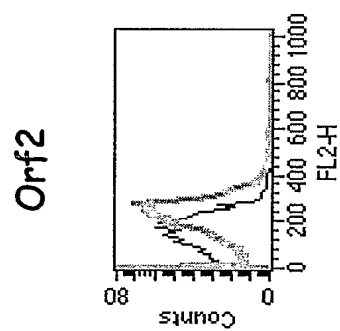
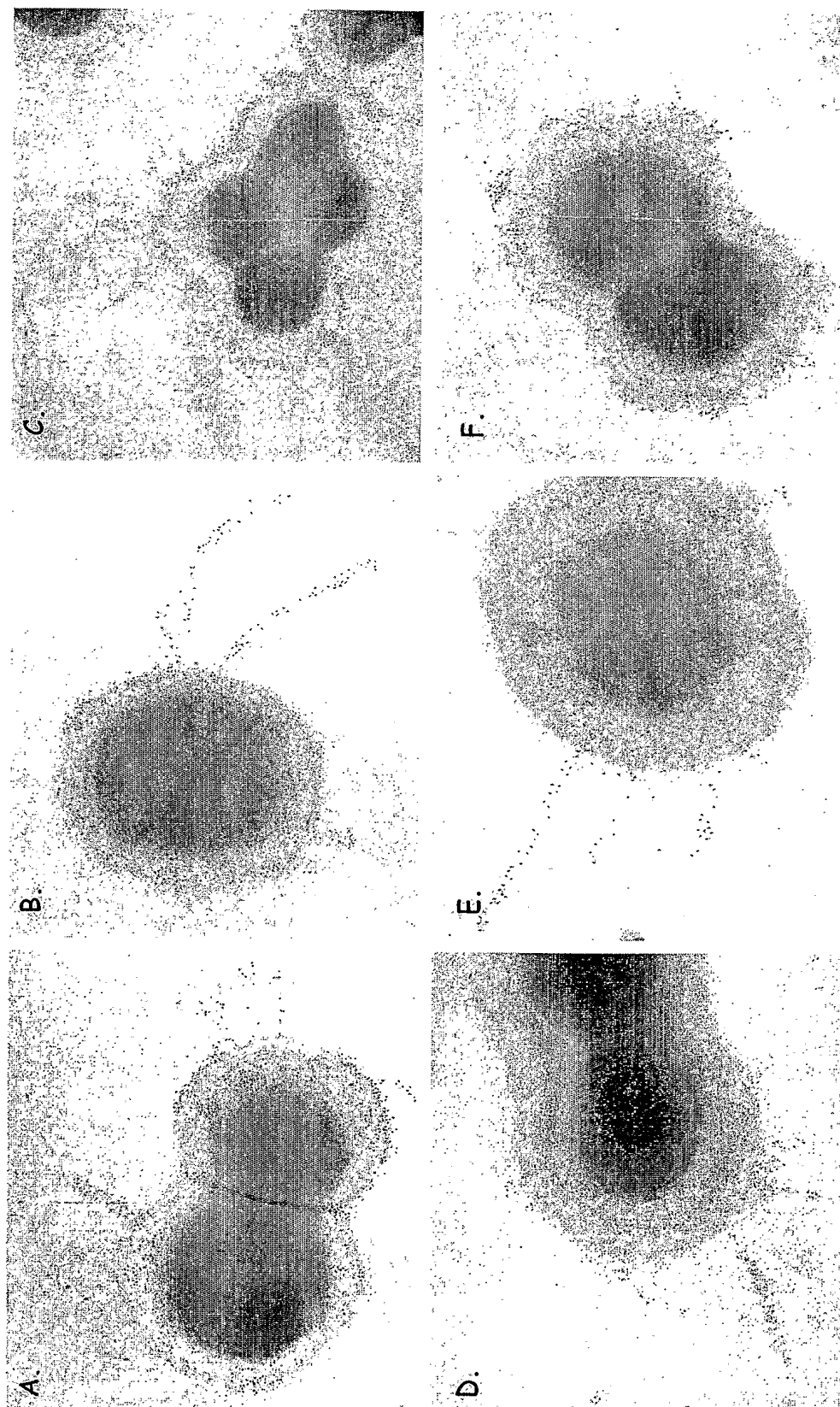


Figure 176



Immunogold labeling with antibodies against: A. B. C. D. E. M6\_Spy0160; F. M6\_Spy0159

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Figure 177

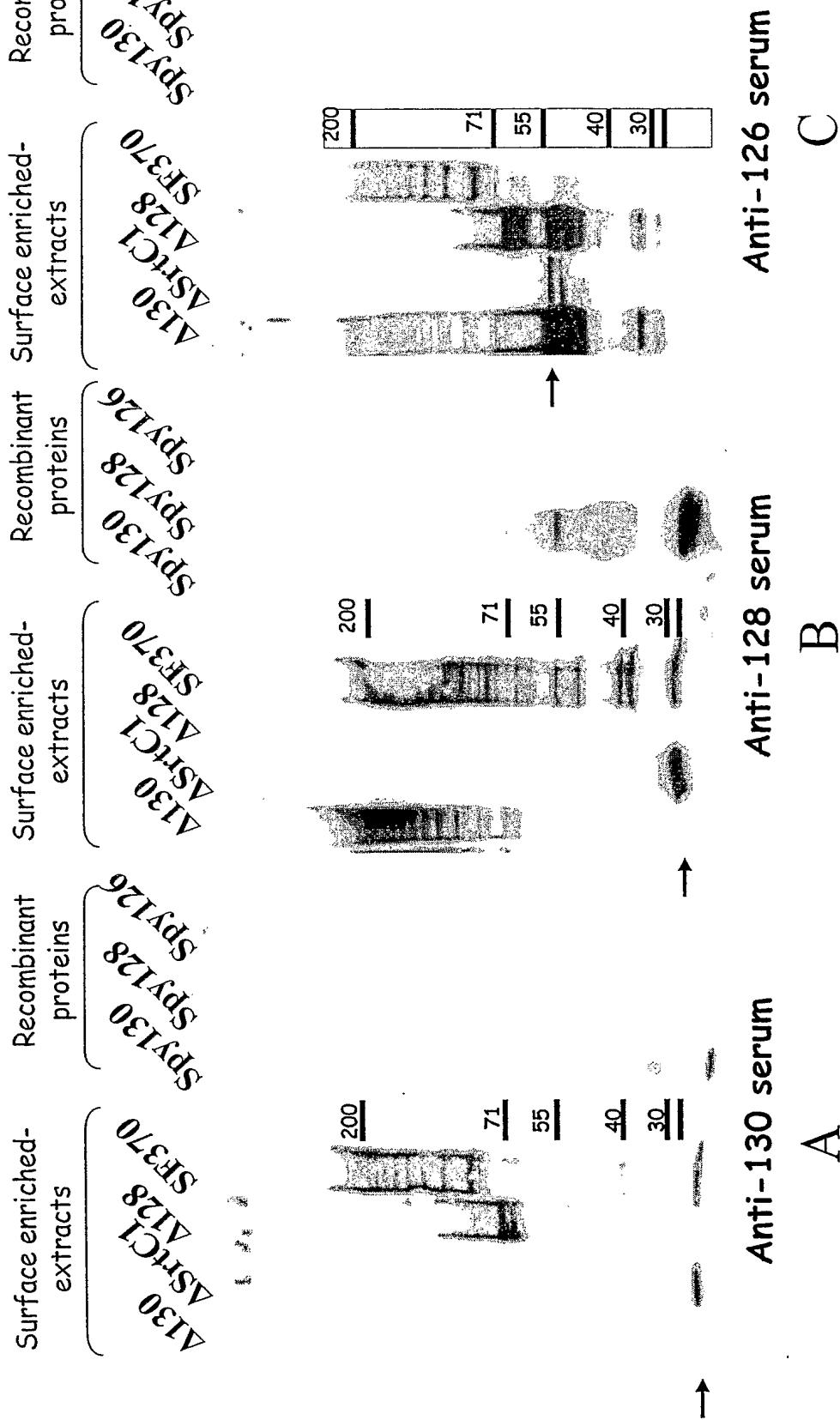
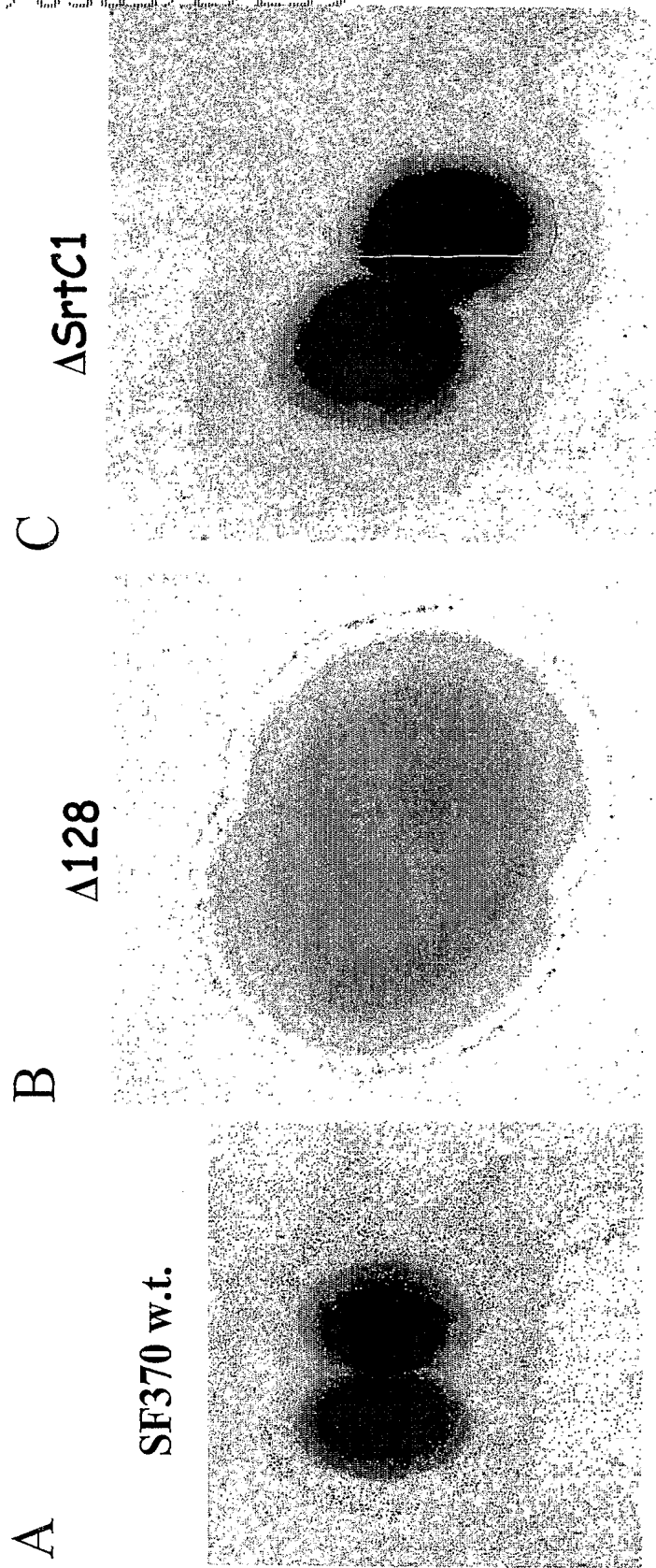


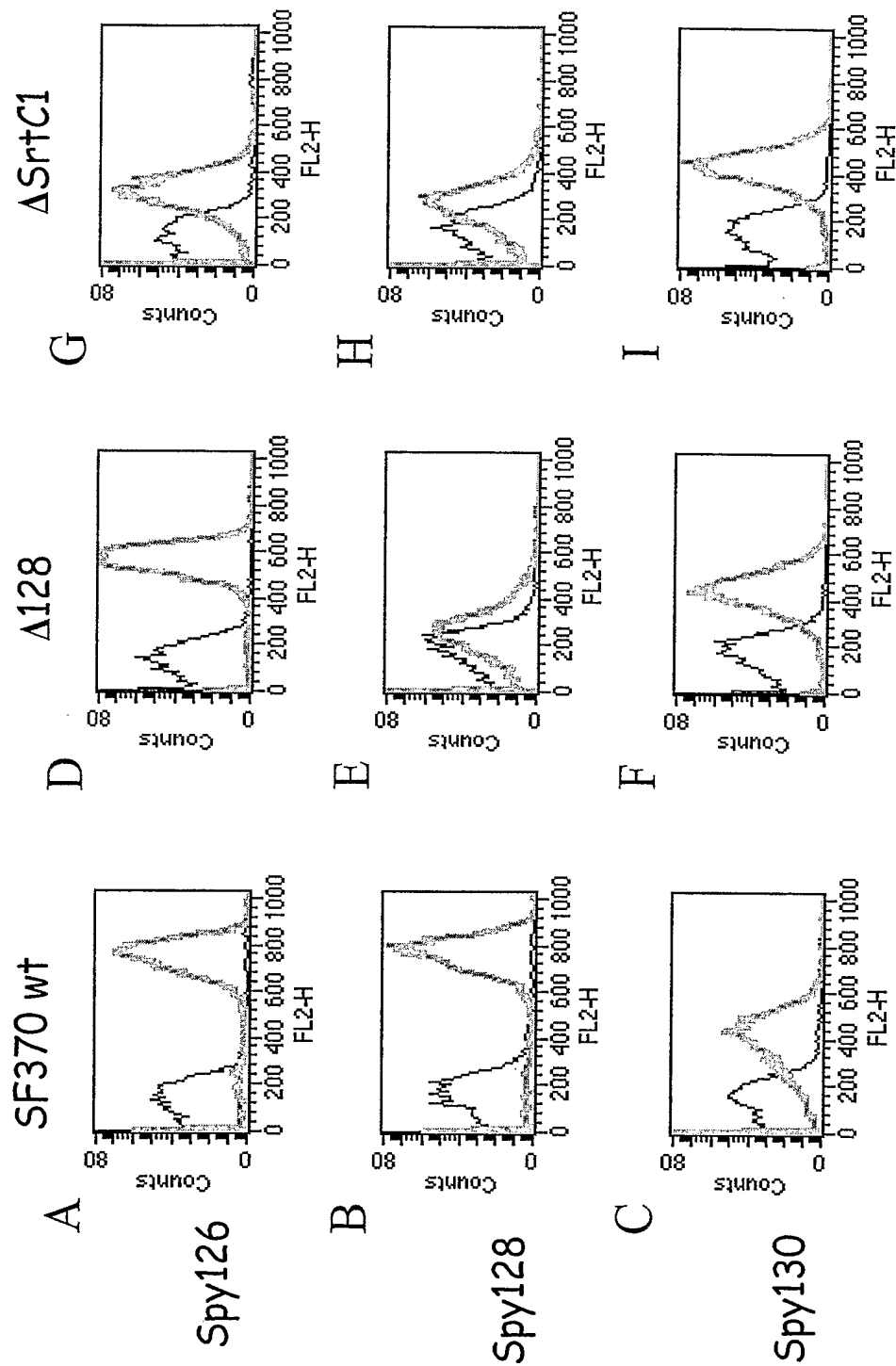
Figure 178



### Immuno-gold labeling with sera against Spy128

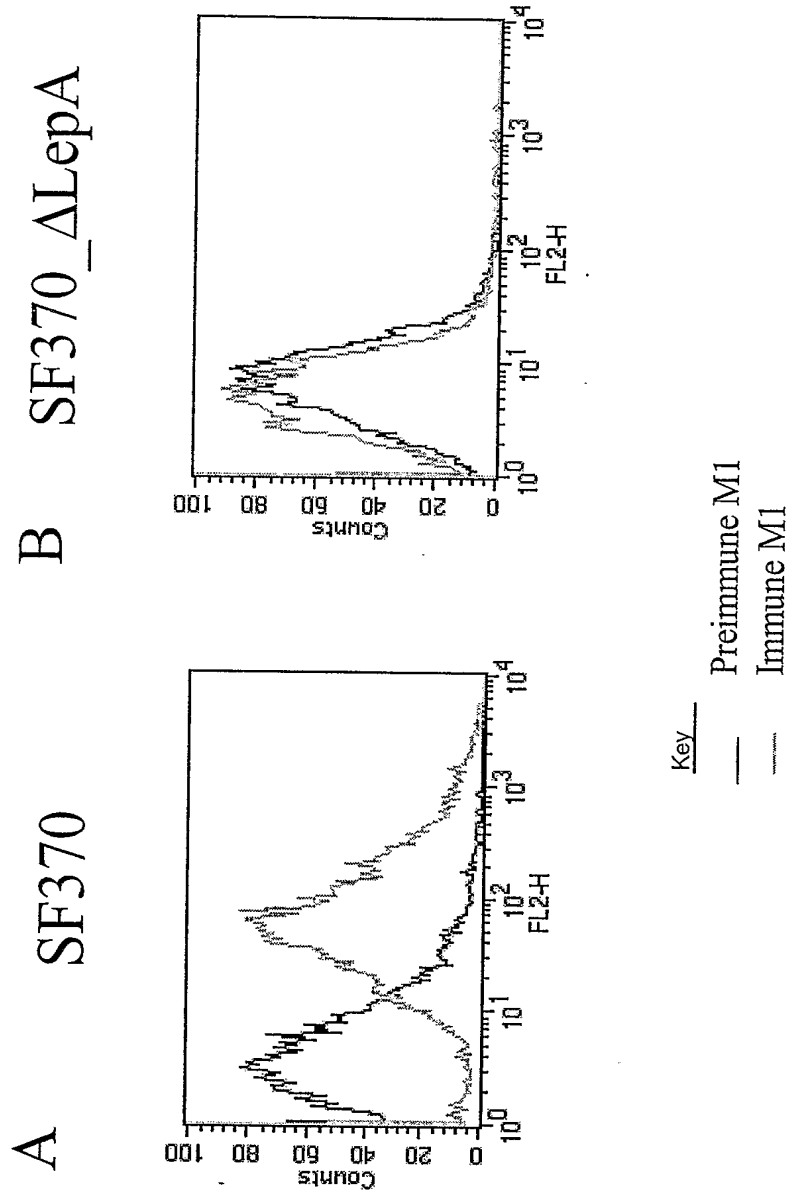
Comparison of wild type and mutant strain by Immunoelectron Microscopy show that Spy128- or SrtC1-lacking bacteria are not able to assemble pili. SrtC1, therefore, is absolutely required for pilus assembly but not for surface anchoring.

Figure 179



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Figure 180



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Figure 181

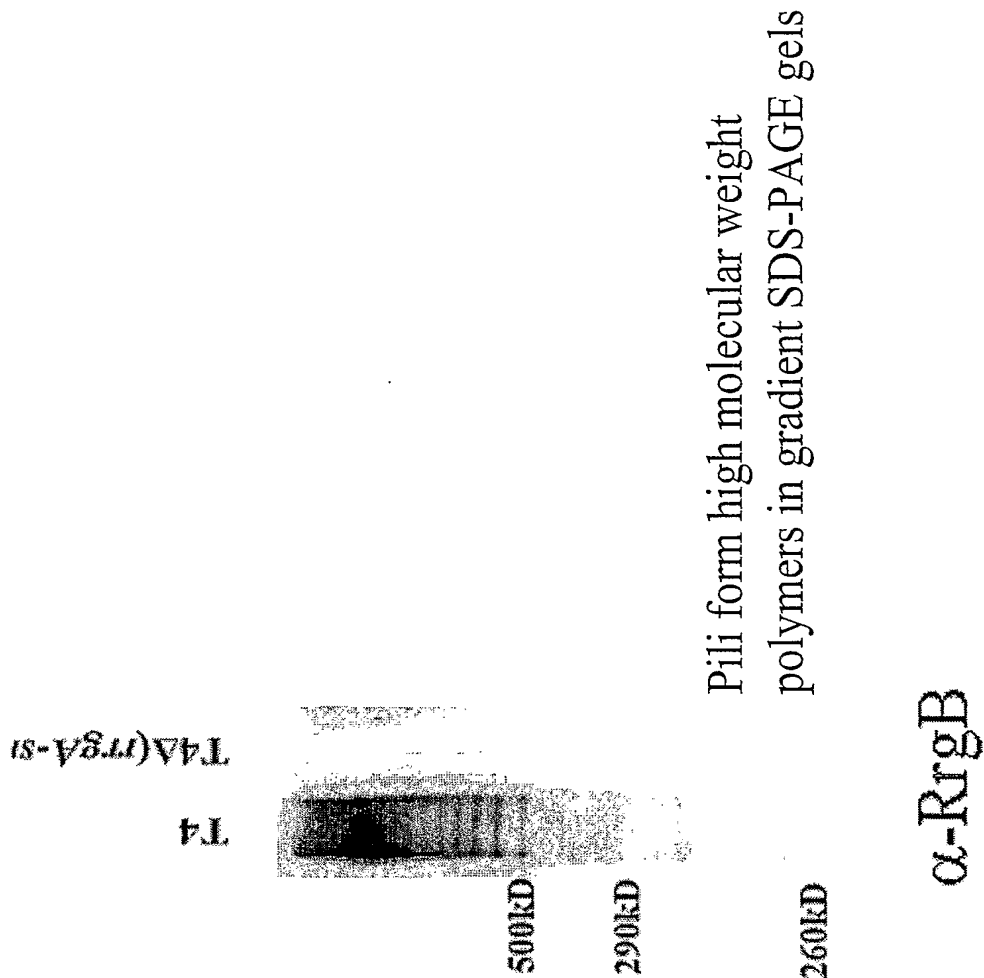
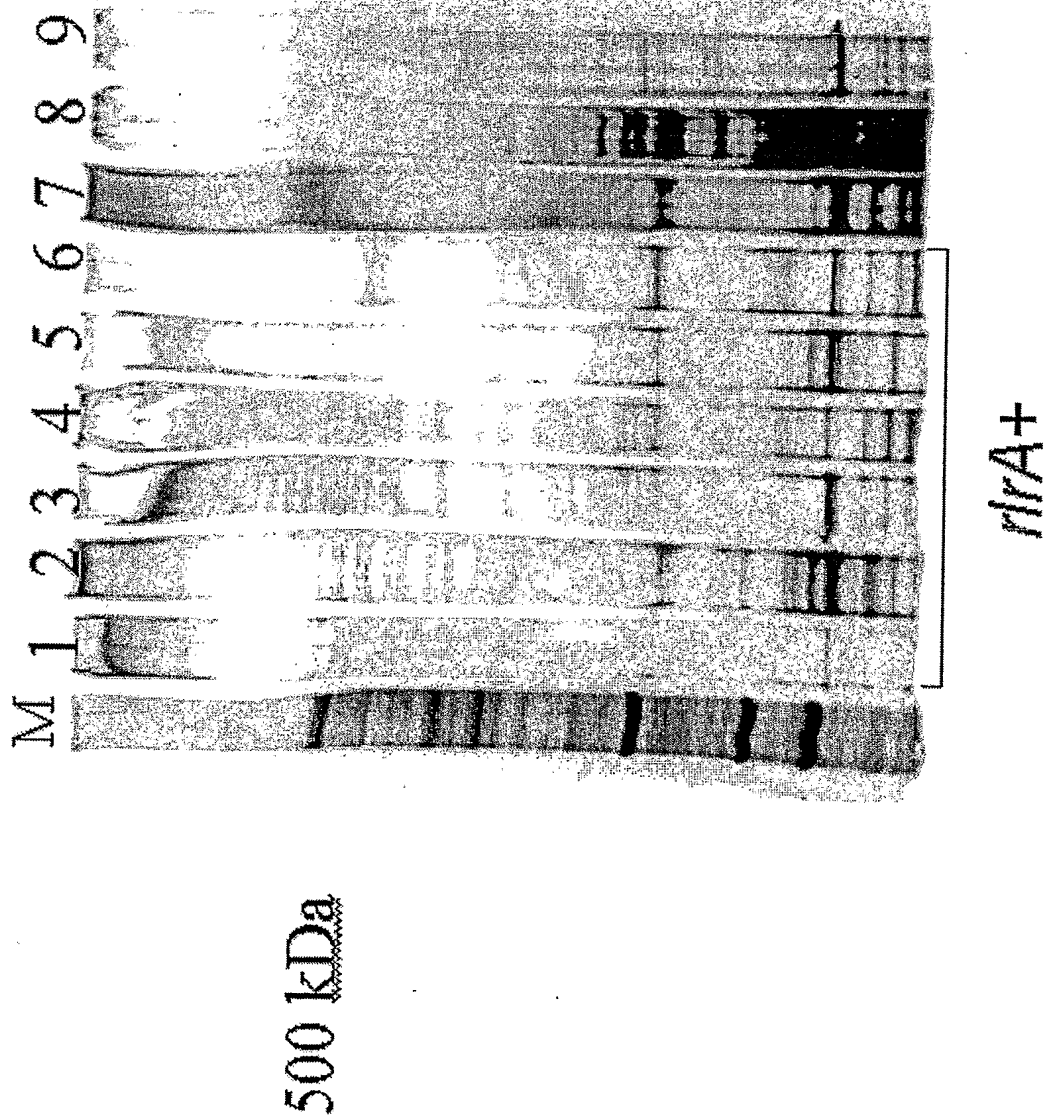
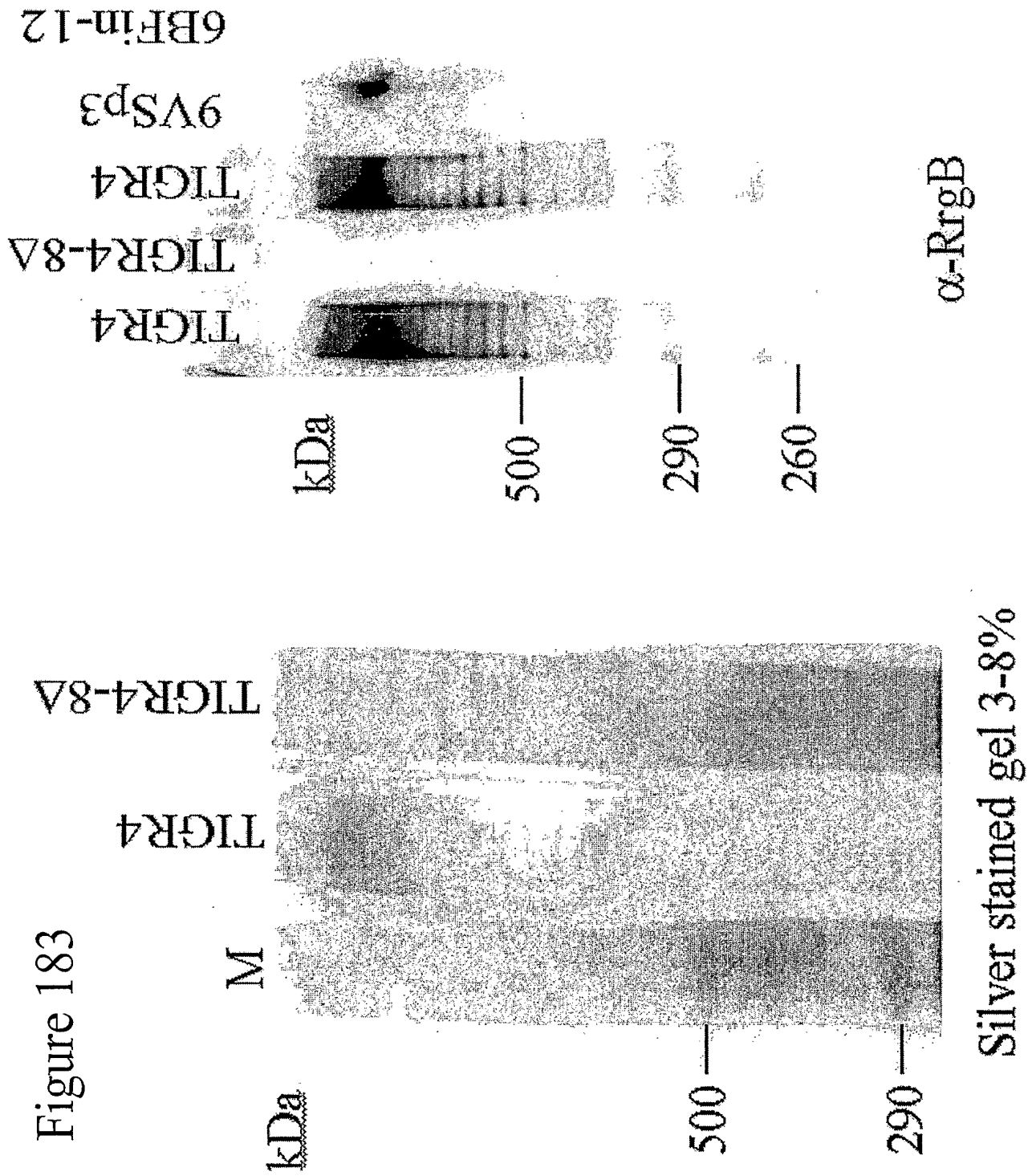


Figure 182





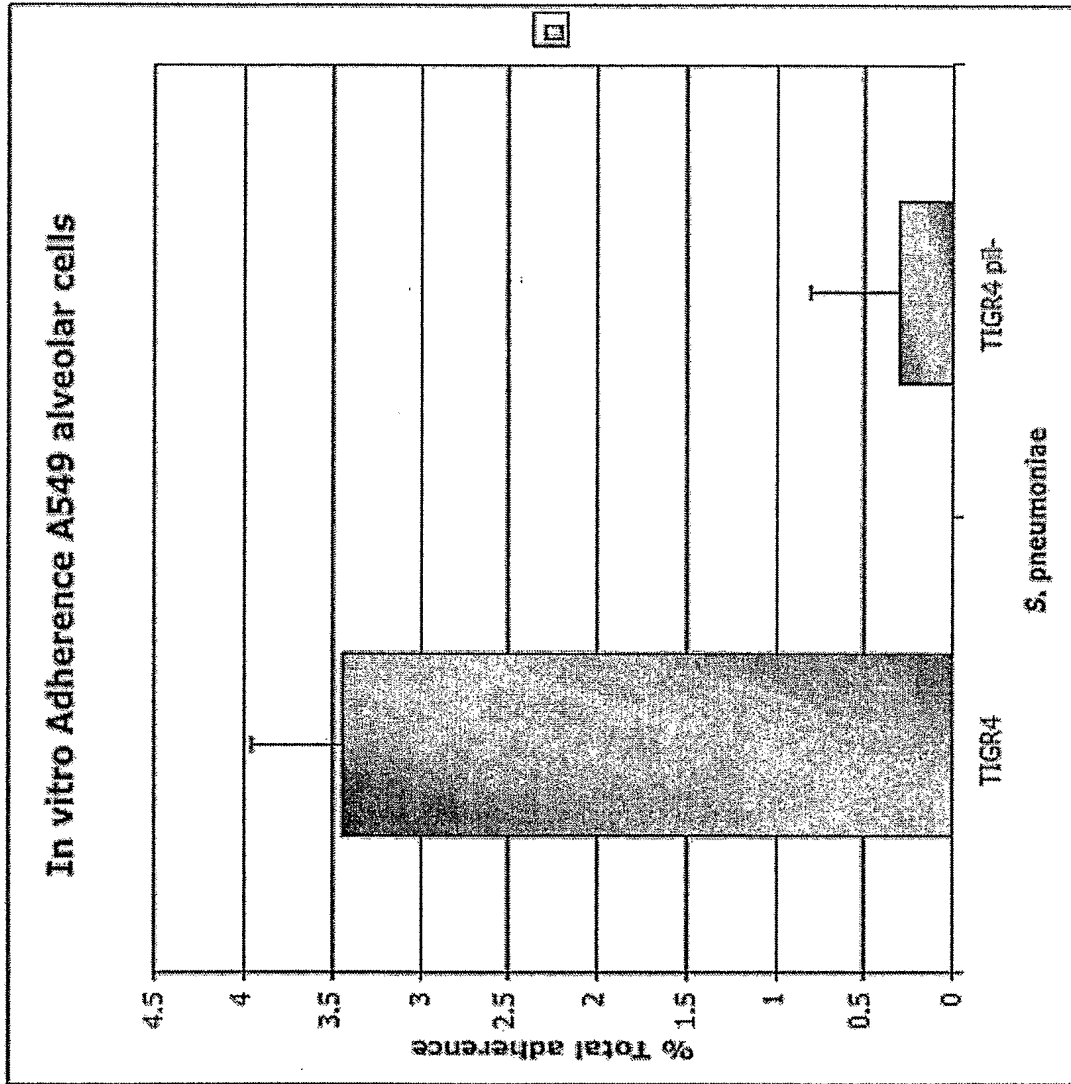


Anti-RrgB TIGR4 recognized the 9v pili

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Figure 184



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Figure 185



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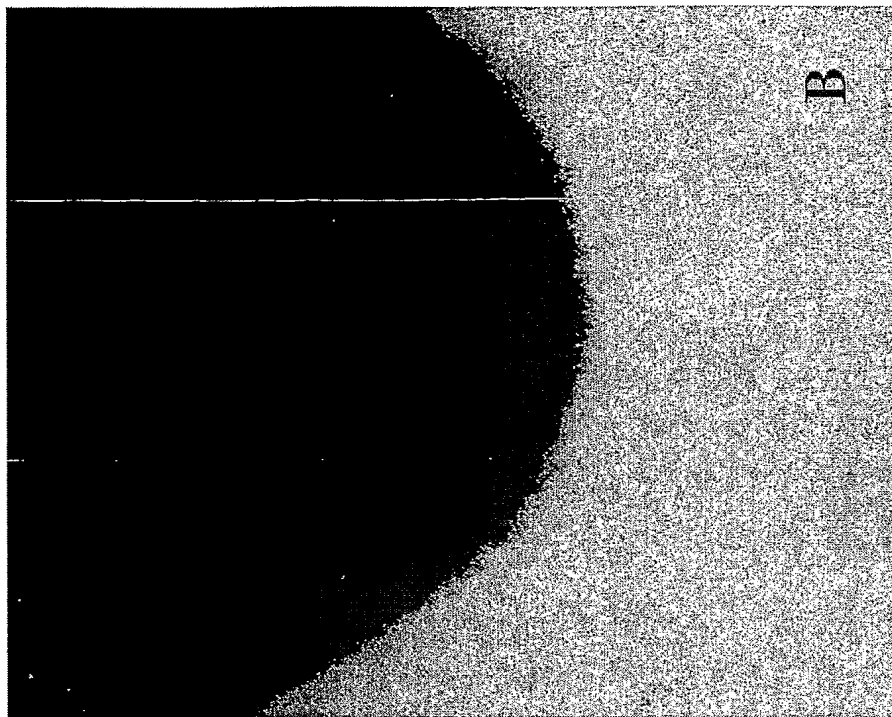


Figure 186

PCT/US05/27239

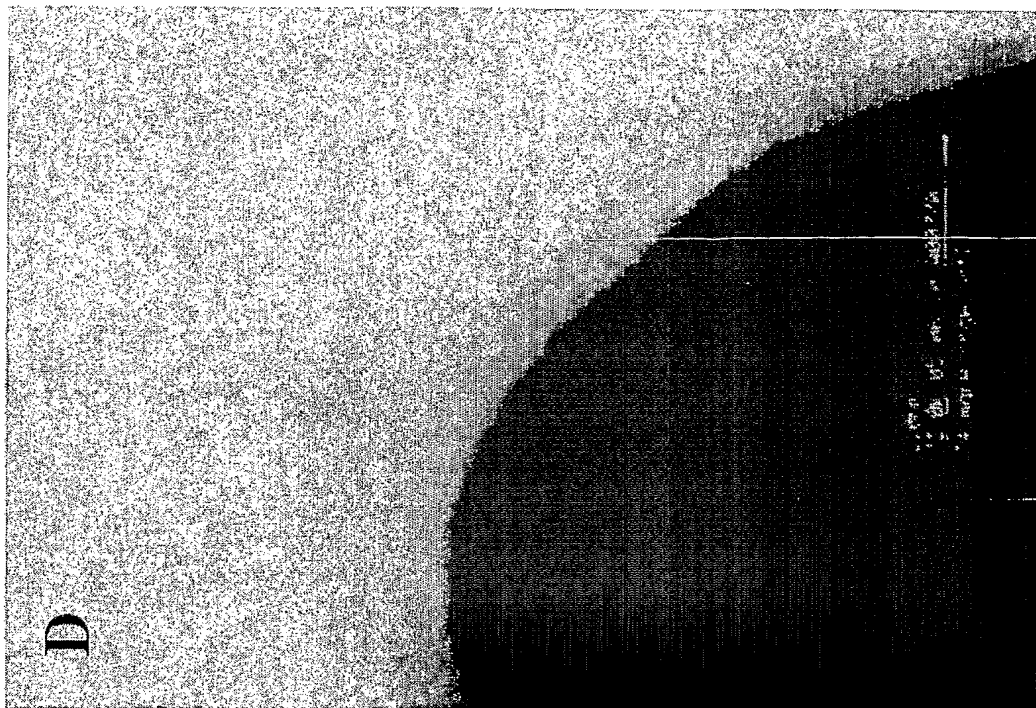


Figure 188

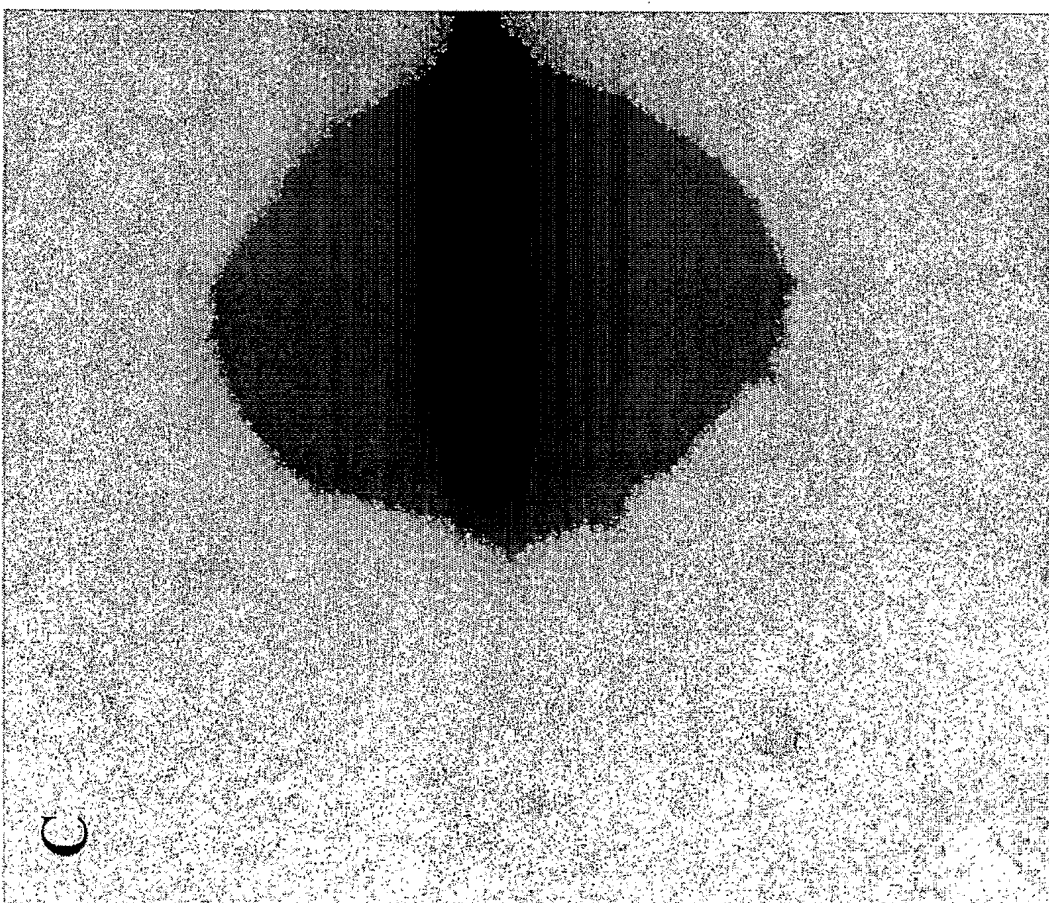
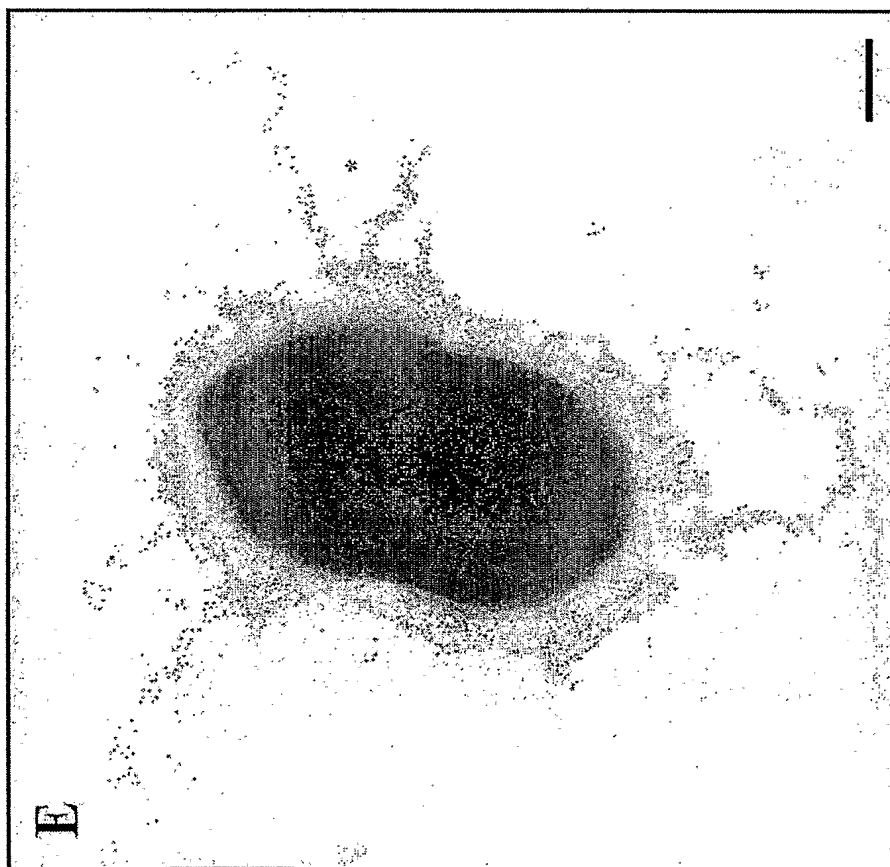


Figure 187

Figure 189



# Figure 190

## *S. pneumoniae* pili proteins: sp0462 (Rrg.A)

### Expression and purification:

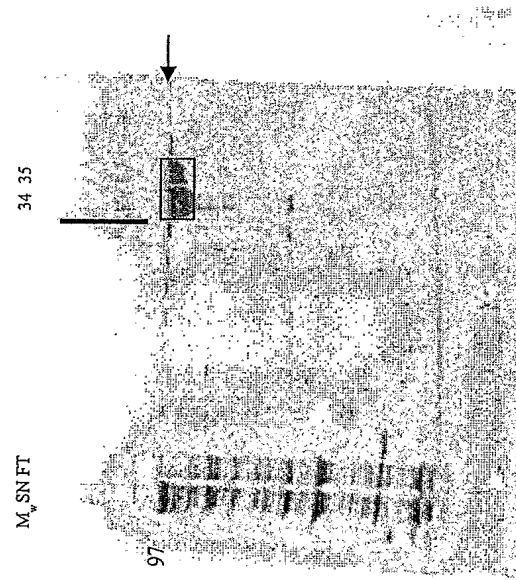
- pET 21b+-*rrg.A-6*
- purified in soluble form (stored at  $-80^{\circ}\text{C}$ ; in  $\text{NaCl}_{\text{physiol.}}$ )



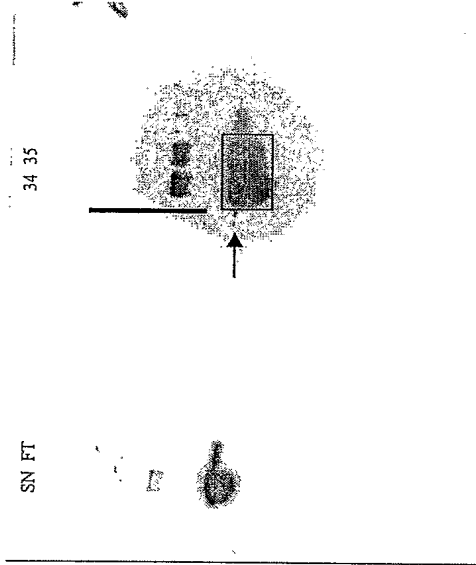
### Results:

- protein conc.: 1,1 mg/ml

A



B



# *S. pneumoniae* pili proteins – antibody production (mice)

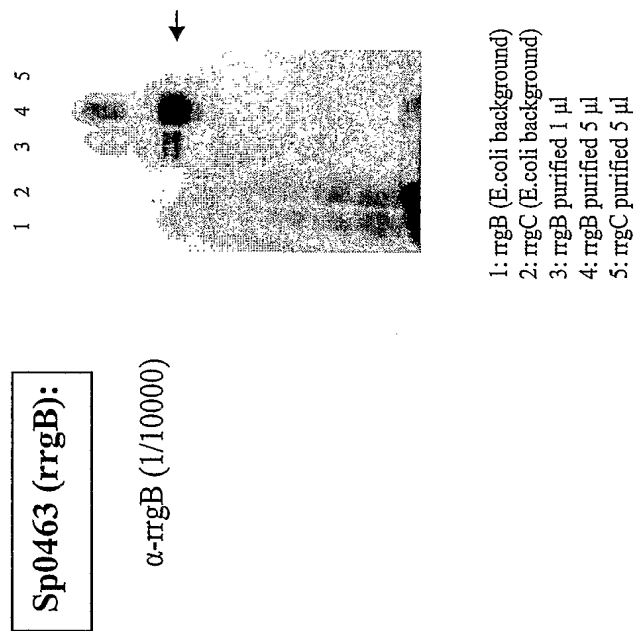


Figure 191



*S. pneumoniae* pili proteins – antibody production (mice)

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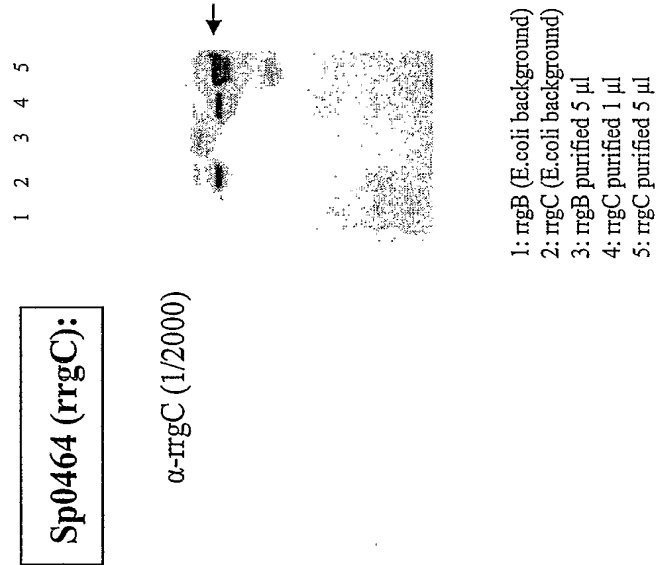
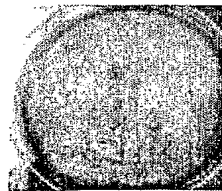


Figure 192

# *S. pneumoniae* TIGR4 pilus purification I – cultivation + digestion



*S. pneumoniae* TIGR4  
Blood plates  
ON/37°C/13h

- Resuspension in PBS/washing
- Resuspension in PPB (4-6 plates/ml)  
(20% sucrose, 10mM MgCl<sub>2</sub>,  
50mM NaPPi pH6.3)

- Digestion with Mutanolysin  
(N-Acetyl Muramidase)  
37°C, ~10 h

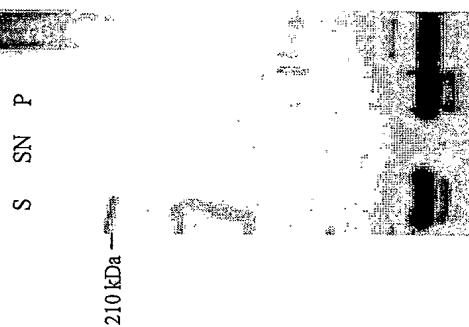
Pellet  
SN

Sucrose Density  
gradient centrifugation

T4

D39

T4/S



Western (1.AK. α-irgB)

T4

S SN P

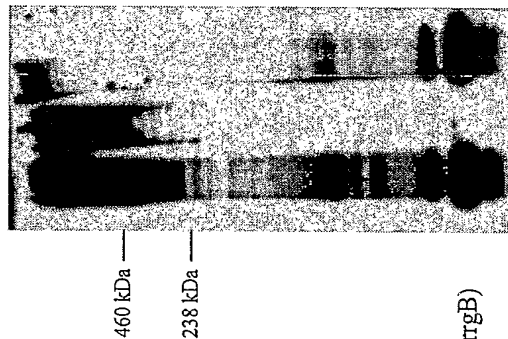


Figure 193

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# *S. pneumoniae* TIGR4 pilus purification II - Sucrose density gradient centrifugation

PCT/US05/027239

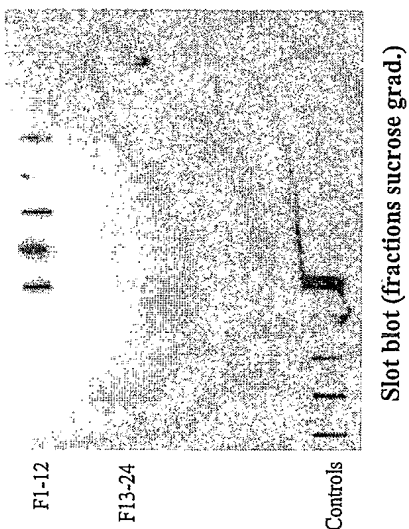
950µl SN  
25-56% linear sucrose gradient  
SW40; 38000, 4°C, 16h



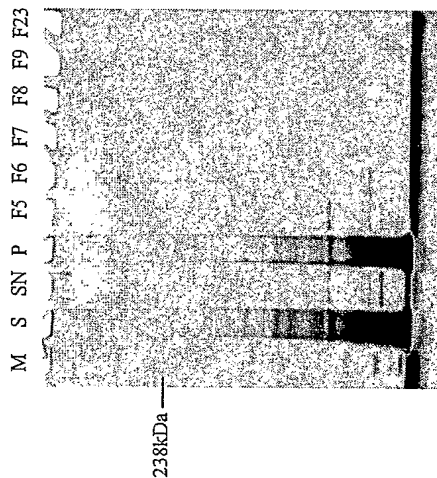
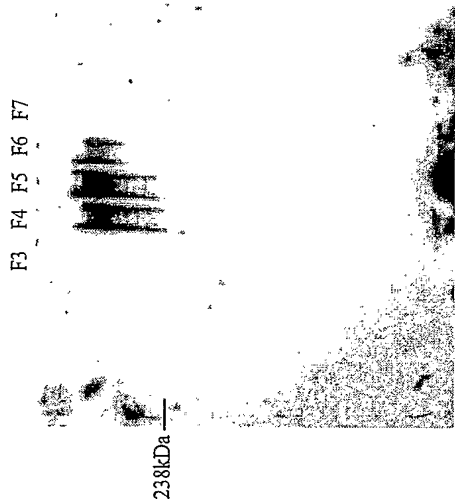
24 x 500 µl fractions  
(Gradient master)



Gel filtration



Western (1.AK. α-rrgB)



Silver Staining

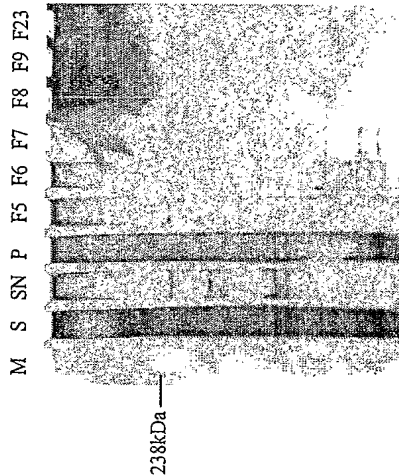


Figure 194

400  $\mu$ l Fr.5  
Superdex 200

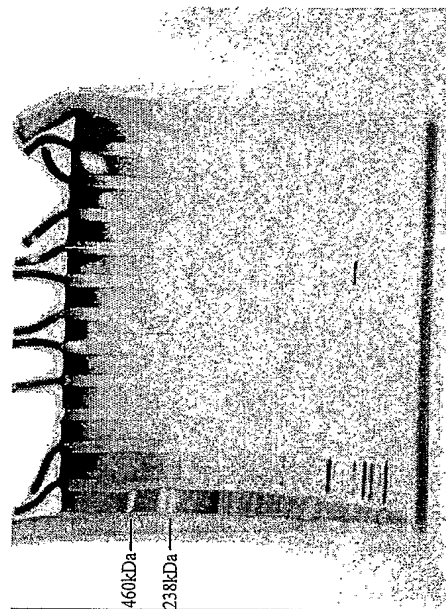
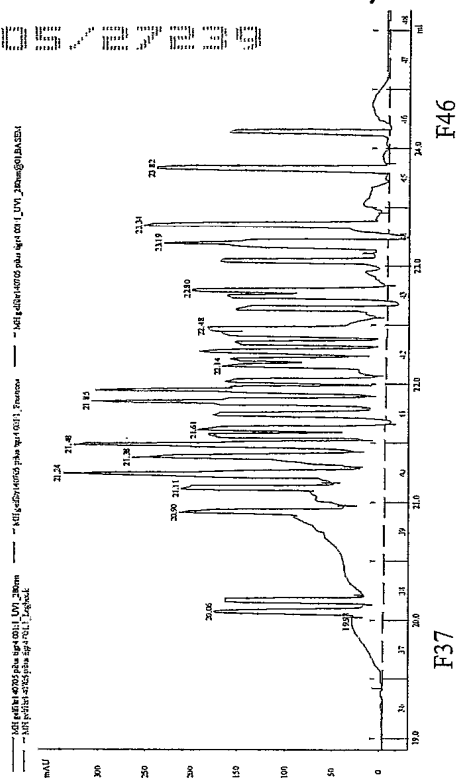
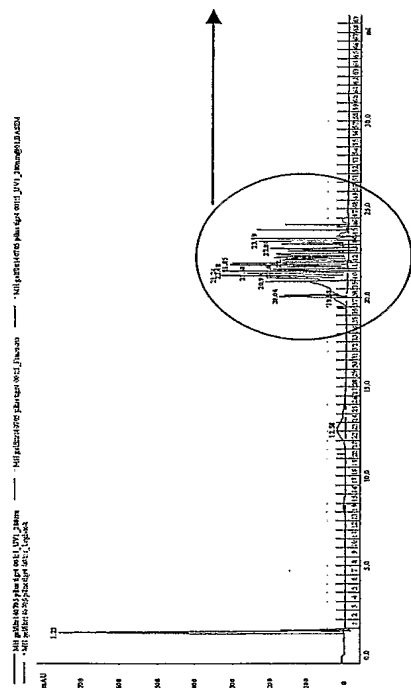


Figure 195

PCT/US2005/027239

14CSR -----GTTTAGGCGCTTTTCATTATAAGTCTTATGGGACTTTTTTGATACTCAAAAAGC  
670 TGAGTTGTTTAGGCGCTTTTCATTATAAGTCTTATGGGACTTTTTTGATACTCAAAAAGC  
6BF -----GTTTAGGCGCTTTTCATTATAAGTCTTATGGGACTTTTTTGATACTCAAAAAGC  
6BSP -----GCGCTTTTCATTATAAGTCTTATGGGACTTTTTTGATACTCAAAAAGC  
19AH -----GTTTAGGCGCTTTTCATTATAAGTCTTATGGGACTTTTTTGATACTCAAAAAGC  
23FPO -----TTTAGGCGCTTTTCATTATAAGTCTTATGGGACTTTTTTGATACTCAAAAAGC  
19FTW -----TTTTTCATTATAAATCTTATGGGACTTTTTTGATACTCAAAAAGC  
9VSP -----TTTAGGCGCTTTTCATTATAAGTCTTATGGGACTTTTTTGATACTCAAAAAGC  
TIGR4 -----TTTAGGCGCTTTTCATTATAAGTCTTATGGGACTTTTTTGATACTCAAAAAGC  
23FTW -----GCGCTTTTCATTATAAGTCTTATGGGACTTTTTTGATACTCAAAAAGC  
\*\*\*\*\*

14CSR CCTATAATCTCCACAGTGGGATTTACCCACTACAGAAATTATAGAGCCAGAAAAACACT  
670 CCTATAATCTCCACAGTGGGATTTACCCACTACAGAAATTATAGAGCCAGAAAAACACT  
6BF CCTATAATCTCCACAGTGGGATTTACCCACTACAGAAATTATAGAGCCAGAAAAACACT  
6BSP CCTATAATCTCCACAGTGGGATTTACCCACTACAGAAATTATAGAGCCAGAAAAACACT  
19AH CCTATAATCTCCACAGTGGGATTTACCCACTACAGAAATTATAGAGCCAGAAAAACACT  
23FPO CCTATAATCTCCACAGTGGGATTTACCCACTACAGAAATTATAGAGCCAGAAAAACACT  
19FTW CCTATAATCTCCACAGTGGGATTTACCCACTACAGAAATTATAGAGCCAGAAAAACACT  
9VSP CCTATAATCTCCACAGTGGGATTTACCCACTACAGAAATTATAGAGCCAGAAAAACACT  
TIGR4 CCTATAATCTCCACAGTGGGATTTACCCACTACAGAAATTATAGAGCCAGAAAAACACT  
23FTW CCTATAATCTCCACAGTGGGATTTACCCACTACAGAAATTATAGAGCCAGAAAAACACT  
\*\*\*\*\*

14CSR TTTGTTCACTAGCAGAACTAGAGAGCAGAAGTGTTTTCTGTTTCTGTTTACCCAAAAC  
670 TTTGTTCACTAGCAGAACTAGAGAGCAGAAGTGTTTTCTGTTTCTGTTTACCCAAAAC  
6BF TTTGTTCACTAGCAGAACTAGAGAGCAGAAGTGTTTTCTGTTTCTGTTTACCCAAAAC  
6BSP TTTGTTCACTAGCAGAACTAGAGAGCAGAAGTGTTTTCTGTTTCTGTTTACCCAAAAC  
19AH TTTGTTCACTAGCAGAACTAGAGAGCAGAAGTGTTTTCTGTTTCTGTTTACCCAAAAC  
23FPO TTTGTTCACTAGCAGAACTAGAGAGCAGAAGTGTTTTCTGTTTCTGTTTACCCAAAAC  
19FTW TTTGTTCACTAGCAGAACTAGAGAGCAGAAGTGTTTTCTGTTTCTGTTTACCCAAAAC  
9VSP TTTGTTCACTAGCAGAACTAGAGAGCAGAAGTGTTTTCTGTTTCTGTTTACCCAAAAC  
TIGR4 TTTGTTCACTAGCAGAACTAGAGAGCAGAAGTGTTTTCTGTTTCTGTTTACCCAAAAC  
23FTW TTTGTTCACTAGCAGAACTAGAGAGCAGAAGTGTTTTCTGTTTCTGTTTACCCAAAAC  
\*\*\*\*\*

14CSR TGGGAAATATGGGGATAAGAATAGAGATGGCTTAGGAAGCCCCCTTTTGTGTGTAGACAG  
670 TGGGAAATATGGGGATAAGAATAGAGATGGCTTAGGAAGCCCCCTTTTGTGTGTAGACAG  
6BF TGGGAAATATGGGGATAAGAATAGAGATGGCTTAGGAAGCCCCCTTTTGTGTGTAGACAG  
6BSP TGGGAAATATGGGGATAAGAATAGAGATGGCTTAGGAAGCCCCCTTTTGTGTGTAGACAG  
19AH TGGGAAATATGGGGATAAGAATAGAGATGGCTTAGGAAGCCCCCTTTTGTGTGTAGACAG  
23FPO TGGGAAATATGGGGATAAGAATAGAGATGGCTTAGGAAGCCCCCTTTTGTGTGTAGACAG  
19FTW TGGGAAATATGGGGATAAGAATAGAGATGGCTTAGGAAGCCCCCTTTTGTGTGTAGACAG  
9VSP TGGGAAATATGGGGATAAGAATAGAGATGGCTTAGGAAGCCCCCTTTTGTGTGTAGACAG  
TIGR4 TGGGAAATATGGGGATAAGAATAGAGATGGCTTAGGAAGCCCCCTTTTGTGTGTAGACAG  
23FTW TGGGAAATATGGGGATAAGAATAGAGATGGCTTAGGAAGCCCCCTTTTGTGTGTAGACAG  
\*\*\*\*\*

14CSR TACGATGAACCTATAACAAATAGTGAGCCTTTTGTAGCAATCATTCGACCCGTTTGTCAA  
670 TACGATGAACCTATAACAAATAGTGAGCCTTTTGTAGCAATCATTCGACCCGTTTGTCAA  
6BF TACGATGAACCTATAACAAATAGTGAGCCTTTTGTAGCAATCATTCGACCCGTTTGTCAA  
6BSP TACGATGAACCTATAACAAATAGTGAGCCTTTTGTAGCAATCATTCGACCCGTTTGTCAA  
19AH TACGATGAACCTATAACAAATAGTGAGCCTTTTGTAGCAATCATTCGACCCGTTTGTCAA  
23FPO TACGATGAACCTATAACAAATAGTGAGCCTTTTGTAGCAATCATTCGACCCGTTTGTCAA  
19FTW TACGATGAACCTATAACAAATAGTGAGCCTTTTGTAGCAATCATTCGACCCGTTTGTCAA  
9VSP TACGATGAACCTATAACAAATAGTGAGCCTTTTGTAGCAATCATTCGACCCGTTTGTCAA  
TIGR4 TACGATGAACCTATAACAAATAGTGAGCCTTTTGTAGCAATCATTCGACCCGTTTGTCAA  
23FTW TACGATGAACCTATAACAAATAGTGAGCCTTTTGTAGCAATCATTCGACCCGTTTGTCAA  
\*\*\*\*\*

Figure 196A

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14CSR AAGCCTCTTTTCGGATATCTACAATTGTCTGATAGATGAGACGCTGTTGGCTAACATGCA  
670 AAGCCTCTTTTCGGATATCTACAATTGTCTGATAGATGAGACGCTGTTGGCTAACATGCA  
6BF AAGCCTCTTTTCGGATATCTACAATTGTCTGATAGATGAGACGCTGTTGGCTAACATGCA  
6BSP AAGCCTCTTTTCGGATATCTACAATTGTCTGATAGATGAGACGCTGTTGGCTAACATGCA  
19AH AAGCCTCTTTTCGGATATCTACAATTGTCTGATAGATGAGACGCTGTTGGCTAACATGCA  
23FPO AAGCCTCTTTTCGGATATCTACAATTGTCTGATAGATGAGACGCTGTTGGCTAACATGCA  
19FTW AAGCCTCTTTTCGGATATCTACAATTGTCTGATAGATGAGACGCTGTTGGCTAACATGCA  
9VSP AAGCCTCTTTTCGGATATCTACAATTGTCTGATAGATGAGACGCTGTTGGCTAACATGCA  
TIGR4 AAGCCTCTTTTCGGATATCTACAATTGTCTGATAGATGAGACGCTGTTGGCTAACATGCA  
23FTW AAGCCTCTTTTCGGATATCTACAATTGTCTGATAGATGAGACGCTGTTGGCTAACATGCA  
\*\*\*\*\*

14CSR AATCTAAGGCAATCGTCAAAAAGTGATGTTTCCCTTTGGGATACTGCTTTTTAACGTAAG  
670 AATCTAAGGCAATCGTCAAAAAGTGATGTTTCCCTTTGGGATACTGCTTTTTAACGTAAG  
6BF AATCTAAGGCAATCGTCAAAAAGTGATGTTTCCCTTTGGGATACTGCTTTTTAACGTAAG  
6BSP AATCTAAGGCAATCGTCAAAAAGTGATGTTTCCCTTTGGGATACTGCTTTTTAACGTAAG  
19AH AATCTAAGGCAATCGTCAAAAAGTGATGTTTCCCTTTGGGATACTGCTTTTTAACGTAAG  
23FPO AATCTAAGGCAATCGTCAAAAAGTGATGTTTCCCTTTGGGATACTGCTTTTTAACGTAAG  
19FTW AATCTAAGGCAATCGTCAAAAAGTGATGTTTCCCTTTGGGATACTGCTTTTTAACGTAAG  
9VSP AATCTAAGGCAATCGTCAAAAAGTGATGTTTCCCTTTGGGATACTGCTTTTTAACGTAAG  
TIGR4 AATCTAAGGCAATCGTCAAAAAGTGATGTTTCCCTTTGGGATACTGCTTTTTAACGTAAG  
23FTW AATCTAAGGCAATCGTCAAAAAGTGATGTTTCCCTTTGGGATACTGCTTTTTAACGTAAG  
\*\*\*\*\*

14CSR GCAGGTATTCTTTTCGTTGTAATAATAATCAATGGCTCTGTCAAATGCTCCTCTGAAGGAG  
670 GCAGGTATTCTTTTCGTTGTAATAATAATCAATGGCTCTGTCAAATGCTCCTCTGAAGGAG  
6BF GCAGGTATTCTTTTCGTTGTAATAATAATCAATGGCTCTGTCAAATGCTCCTCTGAAGGAG  
6BSP GCAGGTATTCTTTTCGTTGTAATAATAATCAATGGCTCTGTCAAATGCTCCTCTGAAGGAG  
19AH GCAGGTATTCTTTTCGTTGTAATAATAATCAATGGCTCTGTCAAATGCTCCTCTGAAGGAG  
23FPO GCAGGTATTCTTTTCGTTGTAATAATAATCAATGGCTCTGTCAAATGCTCCTCTGAAGGAG  
19FTW GCAGGTATTCTTTTCGTTGTAATAATAATCAATGGCTCTGTCAAATGCTCCTCTGAAGGAG  
9VSP GCAGGTATTCTTTTCGTTGTAATAATAATCAATGGCTCTGTCAAATGCTCCTCTGAAGGAG  
TIGR4 GCAGGTATTCTTTTCGTTGTAATAATAATCAATGGCTCTGTCAAATGCTCCTCTGAAGGAG  
23FTW GCAGGTATTCTTTTCGTTGTAATAATAATCAATGGCTCTGTCAAATGCTCCTCTGAAGGAG  
\*\*\*\*\*

14CSR GAGGACTAATTAGAATATTGTATCCTGTAACAGAGGCAACTTTGTGAGTAAATTCGGTA  
670 GAGGACTAATTAGAATATTGTATCCTGTAACAGAGGCAACTTTGTGAGTAAATTCGGTA  
6BF GAGGACTAATTAGAATATTGTATCCTGTAACAGAGGCAACTTTGTGAGTAAATTCGGTA  
6BSP GAGGACTAATTAGAATATTGTATCCTGTAACAGAGGCAACTTTGTGAGTAAATTCGGTA  
19AH GAGGACTAATTAGAATATTGTATCCTGTAACAGAGGCAACTTTGTGAGTAAATTCGGTA  
23FPO GAGGACTAATTAGAATATTGTATCCTGTAACAGAGGCAACTTTGTGAGTAAATTCGGTA  
19FTW GAGGACTAATTAGAATATTGTATCCTGTAACAGAGGCAACTTTGTGAGTAAATTCGGTA  
9VSP GAGGACTAATTAGAATATTGTATCCTGTAACAGAGGCAACTTTGTGAGTAAATTCGGTA  
TIGR4 GAGGACTAATTAGAATATTGTATCCTGTAACAGAGGCAACTTTGTGAGTAAATTCGGTA  
23FTW GAGGACTAATTAGAATATTGTATCCTGTAACAGAGGCAACTTTGTGAGTAAATTCGGTA  
\*\*\*\*\*

14CSR AAATAATGGACTTTATTAAGTTTACATCTGCTTGATTATTTAAATGATAAAAAATCGGGA  
670 AAATAATGGACTTTATTAAGTTTACATCTGCTTGATTATTTAAATGATAAAAAATCGGGA  
6BF AAATAATGGACTTTATTAAGTTTACATCTGCTTGATTATTTAAATGATAAAAAATCGGGA  
6BSP AAATAATGGACTTTATTAAGTTTACATCTGCTTGATTATTTAAATGATAAAAAATCGGGA  
19AH AAATAATGGACTTTATTAAGTTTACATCTGCTTGATTATTTAAATGATAAAAAATCGGGA  
23FPO AAATAATGGACTTTATTAAGTTTACATCTGCTTGATTATTTAAATGATAAAAAATCGGGA  
19FTW AAATAATGGACTTTATTAAGTTTACATCTGCTTGATTATTTAAATGATAAAAAATCGGGA  
9VSP AAATAATGGACTTTATTAAGTTTACATCTGCTTGATTATTTAAATGATAAAAAATCGGGA  
TIGR4 AAATAATGGACTTTATTAAGTTTACATCTGCTTGATTATTTAAATGATAAAAAATCGGGA  
23FTW AAATAATGGACTTTATTAAGTTTACATCTGCTTGATTATTTAAATGATAAAAAATCGGGA  
\*\*\*\*\*

Figure 196B

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14CSR TAGCAGGTAGTGAGGAAAAGATGGTTTCTGTCAAGTAGAGTGAGAAAAGGTACAGCCGAT  
670 TAGCAGGTAGTGAGGAAAAGATGGTTTCTGTCAAGTAGAGTGAGAAAAGGTACAGCCGAT  
6BF TAGCAGGTAGTGAGGAAAAGATGGTTTCTGTCAAGTAGAGTGAGAAAAGGTACAGCCGAT  
6BSP TAGCAGGTAGTGAGGAAAAGATGGTTTCTGTCAAGTAGAGTGAGAAAAGGTACAGCCGAT  
19AH TAGCAGGTAGTGAGGAAAAGATGGTTTCTGTCAAGTAGAGTGAGAAAAGGTACAGCCGAT  
23FPO TAGCAGGTAGTGAGGAAAAGATGGTTTCTGTCAAGTAGAGTGAGAAAAGGTACAGCCGAT  
19FTW TAGCAGGTAGTGAGGAAAAGATGGTTTCTGTCAAGTAGAGTGAGAAAAGGTACAGCCGAT  
9VSP TAGCAGGTAGTGAGGAAAAGATGGTTTCTGTCAAGTAGAGTGAGAAAAGGTACAGCCGAT  
TIGR4 TAGCAGGTAGTGAGGAAAAGATGGTTTCTGTCAAGTAGAGTGAGAAAAGGTACAGCCGAT  
23FTW TAGCAGGTAGTGAGGAAAAGATGGTTTCTGTCAAGTAGAGTGAGAAAAGGTACAGCCGAT  
\*\*\*\*\*

14CSR GCTGGTCGATAACTCCTTCAATCTTCTGCTCAGTCATCCACTCTTGAACAATTGCTTTCG  
670 GCTGGTCGATAACTCCTTCAATCTTCTGCTCAGTCATCCACTCTTGAACAATTGCTTTCG  
6BF GCTGGTCGATAACTCCTTCAATCTTCTGCTCAGTCATCCACTCTTGAACAATTGCTTTCG  
6BSP GCTGGTCGATAACTCCTTCAATCTTCTGCTCAGTCATCCACTCTTGAACAATTGCTTTCG  
19AH GCTGGTCGATAACTCCTTCAATCTTCTGCTCAGTCATCCACTCTTGAACAATTGCTTTCG  
23FPO GCTGGTCGATAACTCCTTCAATCTTCTGCTCAGTCATCCACTCTTGAACAATTGCTTTCG  
19FTW GCTGGTCGATAACTCCTTCAATCTTCTGCTCAGTCATCCACTCTTGAACAATTGCTTTCG  
9VSP GCTGGTCGATAACTCCTTCAATCTTCTGCTCAGTCATCCACTCTTGAACAATTGCTTTCG  
TIGR4 GCTGGTCGATAACTCCTTCAATCTTCTGCTCAGTCATCCACTCTTGAACAATTGCTTTCG  
23FTW GCTGGTCGATAACTCCTTCAATCTTCTGCTCAGTCATCCACTCTTGAACAATTGCTTTCG  
\*\*\*\*\*

14CSR AAATATGATACAGTGGCTTGTGCGCTTCAATCCCATAATGTTTCGTAATAATTATAATAGG  
670 AAATATGATACAGTGGCTTGTGCGCTTCAATCCCATAATGTTTCGTAATAATTATAATAGG  
6BF AAATATGATACAGTGGCTTGTGCGCTTCAATCCCATAATGTTTCGTAATAATTATAATAGG  
6BSP AAATATGATACAGTGGCTTGTGCGCTTCAATCCCATAATGTTTCGTAATAATTATAATAGG  
19AH AAATATGATACAGTGGCTTGTGCGCTTCAATCCCATAATGTTTCGTAATAATTATAATAGG  
23FPO AAATATGATACAGTGGCTTGTGCGCTTCAATCCCATAATGTTTCGTAATAATTATAATAGG  
19FTW AAATATGATACAGTGGCTTGTGCGCTTCAATCCCATAATGTTTCGTAATAATTATAATAGG  
9VSP AAATATGATACAGTGGCTTGTGCGCTTCAATCCCATAATGTTTCGTAATAATTATAATAGG  
TIGR4 AAATATGATACAGTGGCTTGTGCGCTTCAATCCCATAATGTTTCGTAATAATTATAATAGG  
23FTW AAATATGATACAGTGGCTTGTGCGCTTCAATCCCATAATGTTTCGTAATAATTATAATAGG  
\*\*\*\*\*

14CSR GAACTAGATTTTGTAAACCAAACAAAACGTTCTTGTTAAGAAAGTCAGTGCTGTTAAAA  
670 GAACTAGATTTTGTAAACCAAACAAAACGTTCTTGTTAAGAAAGTCAGTGCTGTTAAAA  
6BF GAACTAGATTTTGTAAACCAAACAAAACGTTCTTGTTAAGAAAGTCAGTGCTGTTAAAA  
6BSP GAACTAGATTTTGTAAACCAAACAAAACGTTCTTGTTAAGAAAGTCAGTGCTGTTAAAA  
19AH GAACTAGATTTTGTAAACCAAACAAAACGTTCTTGTTAAGAAAGTCAGTGCTGTTAAAA  
23FPO GAACTAGATTTTGTAAACCAAACAAAACGTTCTTGTTAAGAAAGTCAGTGCTGTTAAAA  
19FTW GAACTAGATTTTGTAAACCAAACAAAACGTTCTTGTTAAGAAAGTCAGTGCTGTTAAAA  
9VSP GAACTAGATTTTGTAAACCAAACAAAACGTTCTTGTTAAGAAAGTCAGTGCTGTTAAAA  
TIGR4 GAACTAGATTTTGTAAACCAAACAAAACGTTCTTGTTAAGAAAGTCAGTGCTGTTAAAA  
23FTW GAACTAGATTTTGTAAACCAAACAAAACGTTCTTGTTAAGAAAGTCAGTGCTGTTAAAA  
\*\*\*\*\*

14CSR AAGAAAGAGAATTTCGAAATGTCATTTCTTAAGATATTCTTGAACCTGGATAGTAGATGCT  
670 AAGAAAGAGAATTTCGAAATGTCATTTCTTAAGATATTCTTGAACCTGGATAGTAGATGCT  
6BF AAGAAAGAGAATTTCGAAATGTCATTTCTTAAGATATTCTTGAACCTGGATAGTAGATGCT  
6BSP AAGAAAGAGAATTTCGAAATGTCATTTCTTAAGATATTCTTGAACCTGGATAGTAGATGCT  
19AH AAGAAAGAGAATTTCGAAATGTCATTTCTTAAGATATTCTTGAACCTGGATAGTAGATGCT  
23FPO AAGAAAGAGAATTTCGAAATGTCATTTCTTAAGATATTCTTGAACCTGGATAGTAGATGCT  
19FTW AAGAAAGAGAATTTCGAAATGTCATTTCTTAAGATATTCTTGAACCTGGATAGTAGATGCT  
9VSP AAGAAAGAGAATTTCGAAATGTCATTTCTTAAGATATTCTTGAACCTGGATAGTAGATGCT  
TIGR4 AAGAAAGAGAATTTCGAAATGTCATTTCTTAAGATATTCTTGAACCTGGATAGTAGATGCT  
23FTW AAGAAAGAGAATTTCGAAATGTCATTTCTTAAGATATTCTTGAACCTGGATAGTAGATGCT  
\*\*\*\*\*

Figure 196C

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14CSR      TTCCTCTTGTATGCTGAAGAATCAGTTGAATAGTATGAGTCTTTTTTTCTTGATTCCATT
670        TTCCTCTTGTATGCTGAAGAATCAGTTGAATAGTATGAGTCTTTTTTTCTTGATTCCATT
6BF        TTCCTCTTGTATGCTGAAGAATCAGTTGAATAGTATGAGTCTTTTTTTCTTGATTCCATT
6BSP       TTCCTCTTGTATGCTGAAGAATCAGTTGAATAGTATGAGTCTTTTTTTCTTGATTCCATT
19AH       TTCCTCTTGTATGCTGAAGAATCAGTTGAATAGTATGAGTCTTTTTTTCTTGATTCCATT
23FPO      TTCCTCTTGTATGCTGAAGAATCAGTTGAATAGTATGAGTCTTTTTTTCTTGATTCCATT
19FTW      TTCCTCTTGTATGCTGAAGAATCAGTTGAATAGTATGAGTCTTTTTTTCTTGATTCCATT
9VSP       TTCCTCTTGTATGCTGAAGAATCAGTTGAATAGTATGAGTCTTTTTTTCTTGATTCCATT
TIGR4      TTCCTCTTGTATGCTGAAGAATCAGTTGAATAGTATGAGTCTTTTTTTCTTGATTCCATT
23FTW      TTCCTCTTGTATGCTGAAGAATCAGTTGAATAGTATGAGTCTTTTTTTCTTGATTCCATT
*****

14CSR      TGTCCCTTGGAAAACGAAGAATTAGCAGAACAAATAAACCAAAAAGATATAATCCAGTTCCTT
670        TGTCCCTTGGAAAACGAAGAATTAGCAGAACAAATAAACCAAAAAGATATAATCCAGTTCCTT
6BF        TGTCCCTTGGAAAACGAAGAATTAGCAGAACAAATAAACCAAAAAGATATAATCCAGTTCCTT
6BSP       TGTCCCTTGGAAAACGAAGAATTAGCAGAACAAATAAACCAAAAAGATATAATCCAGTTCCTT
19AH       TGTCCCTTGGAAAACGAAGAATTAGCAGAACAAATAAACCAAAAAGATATAATCCAGTTCCTT
23FPO      TGTCCCTTGGAAAACGAAGAATTAGCAGAACAAATAAACCAAAAAGATATAATCCAGTTCCTT
19FTW      TGTCCCTTGGAAAACGAAGAATTAGCAGAACAAATAAACCAAAAAGATATAATCCAGTTCCTT
9VSP       TGTCCCTTGGAAAACGAAGAATTAGCAGAACAAATAAACCAAAAAGATATAATCCAGTTCCTT
TIGR4      TGTCCCTTGGAAAACGAAGAATTAGCAGAACAAATAAACCAAAAAGATATAATCCAGTTCCTT
23FTW      TGTCCCTTGGAAAACGAAGAATTAGCAGAACAAATAAACCAAAAAGATATAATCCAGTTCCTT
*****

14CSR      CCTGAGTAAAAGTCATGTTGGCATGTGGCTCTAAGTAAGTTTGGCAATGTTCCATCAAAA
670        CCTGAGTAAAAGTCATGTTGGCATGTGGCTCTAAGTAAGTTTGGCAATGTTCCATCAAAA
6BF        CCTGAGTAAAAGTCATGTTGGCATGTGGCTCTAAGTAAGTTTGGCAATGTTCCATCAAAA
6BSP       CCTGAGTAAAAGTCATGTTGGCATGTGGCTCTAAGTAAGTTTGGCAATGTTCCATCAAAA
19AH       CCTGAGTAAAAGTCATGTTGGCATGTGGCTCTAAGTAAGTTTGGCAATGTTCCATCAAAA
23FPO      CCTGAGTAAAAGTCATGTTGGCATGTGGCTCTAAGTAAGTTTGGCAATGTTCCATCAAAA
19FTW      CCTGAGTAAAAGTCATGTTGGCATGTGGCTCTAAGTAAGTTTGGCAATGTTCCATCAAAA
9VSP       CCTGAGTAAAAGTCATGTTGGCATGTGGCTCTAAGTAAGTTTGGCAATGTTCCATCAAAA
TIGR4      CCTGAGTAAAAGTCATGTTGGCATGTGGCTCTAAGTAAGTTTGGCAATGTTCCATCAAAA
23FTW      CCTGAGTAAAAGTCATGTTGGCATGTGGCTCTAAGTAAGTTTGGCAATGTTCCATCAAAA
*****

14CSR      TCGGATACATAAAGAGGTTTTTTAATTTTTCAAACCTCTTTGGACTCAGGGAACCTCAAGTG
670        TCGGATACATAAAGAGGTTTTTTAATTTTTCAAACCTCTTTGGACTCAGGGAACCTCAAGTG
6BF        TCGGATACATAAAGAGGTTTTTTAATTTTTCAAACCTCTTTGGACTCAGGGAACCTCAAGTG
6BSP       TCGGATACATAAAGAGGTTTTTTAATTTTTCAAACCTCTTTGGACTCAGGGAACCTCAAGTG
19AH       TCGGATACATAAAGAGGTTTTTTAATTTTTCAAACCTCTTTGGACTCAGGGAACCTCAAGTG
23FPO      TCGGATACATAAAGAGGTTTTTTAATTTTTCAAACCTCTTTGGACTCAGGGAACCTCAAGTG
19FTW      TCGGATACATAAAGAGGTTTTTTAATTTTTCAAACCTCTTTGGACTCAGGGAACCTCAAGTG
9VSP       TCGGATACATAAAGAGGTTTTTTAATTTTTCAAACCTCTTTGGACTCAGGGAACCTCAAGTG
TIGR4      TCGGATACATAAAGAGGTTTTTTAATTTTTCAAACCTCTTTGGACTCAGGGAACCTCAAGTG
23FTW      TCGGATACATAAAGAGGTTTTTTAATTTTTCAAACCTCTTTGGACTCAGGGAACCTCAAGTG
*****

14CSR      GAAATTCCCGACGTTTCCAAGTGAGTGCCACTAGTATGCTAAAATGAACATACTCGTCAG
670        GAAATTCCCGACGTTTCCAAGTGAGTGCCACTAGTATGCTAAAATGAACATACTCGTCAG
6BF        GAAATTCCCGACGTTTCCAAGTGAGTGCCACTAGTATGCTAAAATGAACATACTCGTCAG
6BSP       GAAATTCCCGACGTTTCCAAGTGAGTGCCACTAGTATGCTAAAATGAACATACTCGTCAG
19AH       GAAATTCCCGACGTTTCCAAGTGAGTGCCACTAGTATGCTAAAATGAACATACTCGTCAG
23FPO      GAAATTCCCGACGTTTCCAAGTGAGTGCCACTAGTATGCTAAAATGAACATACTCGTCAG
19FTW      GAAATTCCCGACGTTTCCAAGTGAGTGCCACTAGTATGCTAAAATGAACATACTCGTCAG
9VSP       GAAATTCCCGACGTTTCCAAGTGAGTGCCACTAGTATGCTAAAATGAACATACTCGTCAG
TIGR4      GAAATTCCCGACGTTTCCAAGTGAGTGCCACTAGTATGCTAAAATGAACATACTCGTCAG
23FTW      GAAATTCCCGACGTTTCCAAGTGAGTGCCACTAGTATGCTAAAATGAACATACTCGTCAG
*****

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Figure 196D



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14CSR GTGTGATTTCTAACAGTTCATGACTGAGTTGAGAATTAGACTGCACAATCATATGTGTGA  
670 GTGTGATTTCTAACAGTTCATGACTGAGTTGAGAATTAGACTGCACAATCATATGTGTGA  
6BF GTGTGATTTCTAACAGTTCATGACTGAGTTGAGAATTAGACTGCACAATCATATGTGTGA  
6BSP GTGTGATTTCTAACAGTTCATGACTGAGTTGAGAATTAGACTGCACAATCATATGTGTGA  
19AH GTGTGATTTCTAACAGTTCATGACTGAGTTGAGAATTAGACTGCACAATCATATGTGTGA  
23FPO GTGTGATTTCTAACAGTTCATGACTGAGTTGAGAATTAGACTGCACAATCATATGTGTGA  
19FTW GTGTGATTTCTAACAGTTCATGACTGAGTTGAGAATTAGACTGCACAATCATATGTGTGA  
9VSP GTGTGATTTCTAACAGTTCATGACTGAGTTGAGAATTAGACTGCACAATCATATGTGTGA  
TIGR4 GTGTGATTTCTAACAGTTCATGACTGAGTTGAGAATTAGACTGCACAATCATATGTGTGA  
23FTW GTGTGATTTCTAACAGTTCATGACTGAGTTGAGAATTAGACTGCACAATCATATGTGTGA  
\*\*\*\*\*

14CSR CCCAATCCATACTTCCATCATTTCAAATCATAAATCTCAATACCAAAATGAAACTGGAGGA  
670 CCCAATCCATACTTCCATCATTTCAAATCATAAATCTCAATACCAAAATGAAACTGGAGGA  
6BF CCCAATCCATACTTCCATCATTTCAAATCATAAATCTCAATACCAAAATGAAACTGGAGGA  
6BSP CCCAATCCATACTTCCATCATTTCAAATCATAAATCTCAATACCAAAATGAAACTGGAGGA  
19AH CCCAATCCATACTTCCATCATTTCAAATCATAAATCTCAATACCAAAATGAAACTGGAGGA  
23FPO CCCAATCCATACTTCCATCATTTCAAATCATAAATCTCAATACCAAAATGAAACTGGAGGA  
19FTW CCCAATCCATACTTCCATCATTTCAAATCATAAATCTCAATACCAAAATGAAACTGGAGGA  
9VSP CCCAATCCATACTTCCATCATTTCAAATCATAAATCTCAATACCAAAATGAAACTGGAGGA  
TIGR4 CCCAATCCATACTTCCATCATTTCAAATCATAAATCTCAATACCAAAATGAAACTGGAGGA  
23FTW CCCAATCCATACTTCCATCATTTCAAATCATAAATCTCAATACCAAAATGAAACTGGAGGA  
\*\*\*\*\*

14CSR GTGCAATTAAAAACGAATGCGATATT CAGGACCAACTACTTGATTTTTT CACAAGGTCCA  
670 GTGCAATTAAAAACGAATGCGATATT CAGGACCAACTACTTGATTTTTT CACAAGGTCCA  
6BF GTGCAATTAAAAACGAATGCGATATT CAGGACCAACTACTTGATTTTTT CACAAGGTCCA  
6BSP GTGCAATTAAAAACGAATGCGATATT CAGGACCAACTACTTGATTTTTT CACAAGGTCCA  
19AH GTGCAATTAAAAACGAATGCGATATT CAGGACCAACTACTTGATTTTTT CACAAGGTCCA  
23FPO GTGCAATTAAAAACGAATGCGATATT CAGGACCAACTACTTGATTTTTT CACAAGGTCCA  
19FTW GTGCAATTAAAAACGAATGCGATATT CAGGACCAACTACTTGATTTTTT CACAAGGTCCA  
9VSP GTGCAATTAAAAACGAATGCGATATT CAGGACCAACTACTTGATTTTTT CACAAGGTCCA  
TIGR4 GTGCAATTAAAAACGAATGCGATATT CAGGACCAACTACTTGATTTTTT CACAAGGTCCA  
23FTW GTGCAATTAAAAACGAATGCGATATT CAGGACCAACTACTTGATTTTTT CACAAGGTCCA  
\*\*\*\*\*

14CSR AACCTACTGAACGTAGTAACAAGCCACACTTTTGTGTCGACGCGGTAGCCTGTTGCGATGG  
670 AACCTACTGAACGTAGTAACAAGCCACACTTTTGTGTCGACGCGGTAGCCTGTTGCGATGG  
6BF AACCTACTGAACGTAGTAACAAGCCACACTTTTGTGTCGACGCGGTAGCCTGTTGCGATGG  
6BSP AACCTACTGAACGTAGTAACAAGCCACACTTTTGTGTCGACGCGGTAGCCTGTTGCGATGG  
19AH AACCTACTGAACGTAGTAACAAGCCACACTTTTGTGTCGACGCGGTAGCCTGTTGCGATGG  
23FPO AACCTACTGAACGTAGTAACAAGCCACACTTTTGTGTCGACGCGGTAGCCTGTTGCGATGG  
19FTW AACCTACTGAACGTAGTAACAAGCCACACTTTTGTGTCGACGCGGTAGCCTGTTGCGATGG  
9VSP AACCTACTGAACGTAGTAACAAGCCACACTTTTGTGTCGACGCGGTAGCCTGTTGCGATGG  
TIGR4 AACCTACTGAACGTAGTAACAAGCCACACTTTTGTGTCGACGCGGTAGCCTGTTGCGATGG  
23FTW AACCTACTGAACGTAGTAACAAGCCACACTTTTGTGTCGACGCGGTAGCCTGTTGCGATGG  
\*\*\*\*\*

14CSR AAATATACTCTTTTGTGTAAATTCGTTAAAGCTTTGATTACCTTGTAGTAGAAGAAGC  
670 AAATATACTCTTTTGTGTAAATTCGTTAAAGCTTTGATTACCTTGTAGTAGAAGAAGC  
6BF AAATATACTCTTTTGTGTAAATTCGTTAAAGCTTTGATTACCTTGTAGTAGAAGAAGC  
6BSP AAATATACTCTTTTGTGTAAATTCGTTAAAGCTTTGATTACCTTGTAGTAGAAGAAGC  
19AH AAATATACTCTTTTGTGTAAATTCGTTAAAGCTTTGATTACCTTGTAGTAGAAGAAGC  
23FPO AAATATACTCTTTTGTGTAAATTCGTTAAAGCTTTGATTACCTTGTAGTAGAAGAAGC  
19FTW AAATATACTCTTTTGTGTAAATTCGTTAAAGCTTTGATTACCTTGTAGTAGAAGAAGC  
9VSP AAATATACTCTTTTGTGTAAATTCGTTAAAGCTTTGATTACCTTGTAGTAGAAGAAGC  
TIGR4 AAATATACTCTTTTGTGTAAATTCGTTAAAGCTTTGATTACCTTGTAGTAGAAGAAGC  
23FTW AAATATACTCTTTTGTGTAAATTCGTTAAAGCTTTGATTACCTTGTAGTAGAAGAAGC  
\*\*\*\*\*

Figure 196E

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14CSR GGAGTATTTTTAAAATAGTTGATTGGTTTATAAAGCTGATGGAAGTAATAATTCGTTTGAT  
670 GGAGTATTTTTAAAATAGTTGATTGGTTTATAAAGCTGATGGAAGTAATAATTCGTTTGAT  
6BF GGAGTATTTTTAAAATAGTTGATTGGTTTATAAAGCTGATGGAAGTAATAATTCGTTTGAT  
6BSP GGAGTATTTTTAAAATAGTTGATTGGTTTATAAAGCTGATGGAAGTAATAATTCGTTTGAT  
19AH GGAGTATTTTTAAAATAGTTGATTGGTTTATAAAGCTGATGGAAGTAATAATTCGTTTGAT  
23FPO GGAGTATTTTTAAAATAGTTGATTGGTTTATAAAGCTGATGGAAGTAATAATTCGTTTGAT  
19FTW GGAGTATTTTTAAAATAGTTGATTGGTTTATAAAGCTGATGGAAGTAATAATTCGTTTGAT  
9VSP GGAGTATTTTTAAAATAGTTGATTGGTTTATAAAGCTGATGGAAGTAATAATTCGTTTGAT  
TIGR4 GGAGTATTTTTAAAATAGTTGATTGGTTTATAAAGCTGATGGAAGTAATAATTCGTTTGAT  
23FTW GGAGTATTTTTAAAATAGTTGATTGGTTTATAAAGCTGATGGAAGTAATAATTCGTTTGAT  
\*\*\*\*\*

14CSR GAGAATGGTGTTCGATTAAATGAACCTGTTGCGTATCTAAATTAAATGTCAACTCTTCCT  
670 GAGAATGGTGTTCGATTAAATGAACCTGTTGCGTATCTAAATTAAATGTCAACTCTTCCT  
6BF GAGAATGGTGTTCGATTAAATGAACCTGTTGCGTATCTAAATTAAATGTCAACTCTTCCT  
6BSP GAGAATGGTGTTCGATTAAATGAACCTGTTGCGTATCTAAATTAAATGTCAACTCTTCCT  
19AH GAGAATGGTGTTCGATTAAATGAACCTGTTGCGTATCTAAATTAAATGTCAACTCTTCCT  
23FPO GAGAATGGTGTTCGATTAAATGAACCTGTTGCGTATCTAAATTAAATGTCAACTCTTCCT  
19FTW GAGAATGGTGTTCGATTAAATGAACCTGTTGCGTATCTAAATTAAATGTCAACTCTTCCT  
9VSP GAGAATGGTGTTCGATTAAATGAACCTGTTGCGTATCTAAATTAAATGTCAACTCTTCCT  
TIGR4 GAGAATGGTGTTCGATTAAATGAACCTGTTGCGTATCTAAATTAAATGTCAACTCTTCCT  
23FTW GAGAATGGTGTTCGATTAAATGAACCTGTTGCGTATCTAAATTAAATGTCAACTCTTCCT  
\*\*\*\*\*

14CSR CGAATGTTTCTTGTAATTCCTGCAAAATGCTTAGGAGACTTTTAGATTGTAATGAAGTTA  
670 CGAATGTTTCTTGTAATTCCTGCAAAATGCTTAGGAGACTTTTAGATTGTAATGAAGTTA  
6BF CGAATGTTTCTTGTAATTCCTGCAAAATGCTTAGGAGACTTTTAGATTGTAATGAAGTTA  
6BSP CGAATGTTTCTTGTAATTCCTGCAAAATGCTTAGGAGACTTTTAGATTGTAATGAAGTTA  
19AH CGAATGTTTCTTGTAATTCCTGCAAAATGCTTAGGAGACTTTTAGATTGTAATGAAGTTA  
23FPO CGAATGTTTCTTGTAATTCCTGCAAAATGCTTAGGAGACTTTTAGATTGTAATGAAGTTA  
19FTW CGAATGTTTCTTGTAATTCCTGCAAAATGCTTAGGAGACTTTTAGATTGTAATGAAGTTA  
9VSP CGAATGTTTCTTGTAATTCCTGCAAAATGCTTAGGAGACTTTTAGATTGTAATGAAGTTA  
TIGR4 CGAATGTTTCTTGTAATTCCTGCAAAATGCTTAGGAGACTTTTAGATTGTAATGAAGTTA  
23FTW CGAATGTTTCTTGTAATTCCTGCAAAATGCTTAGGAGACTTTTAGATTGTAATGAAGTTA  
\*\*\*\*\*

14CSR AAGTAGACAGTTCATCTAGTTCAATAGACCGAATATCCAATAATATATTTAAAATGGTAA  
670 AAGTAGACAGTTCATCTAGTTCAATAGACCGAATATCCAATAATATATTTAAAATGGTAA  
6BF AAGTAGACAGTTCATCTAGTTCAATAGACCGAATATCCAATAATATATTTAAAATGGTAA  
6BSP AAGTAGACAGTTCATCTAGTTCAATAGACCGAATATCCAATAATATATTTAAAATGGTAA  
19AH AAGTAGACAGTTCATCTAGTTCAATAGACCGAATATCCAATAATATATTTAAAATGGTAA  
23FPO AAGTAGACAGTTCATCTAGTTCAATAGACCGAATATCCAATAATATATTTAAAATGGTAA  
19FTW AAGTAGACAGTTCATCTAGTTCAATAGACCGAATATCCAATAATATATTTAAAATGGTAA  
9VSP AAGTAGACAGTTCATCTAGTTCAATAGACCGAATATCCAATAATATATTTAAAATGGTAA  
TIGR4 AAGTAGACAGTTCATCTAGTTCAATAGACCGAATATCCAATAATATATTTAAAATGGTAA  
23FTW AAGTAGACAGTTCATCTAGTTCAATAGACCGAATATCCAATAATATATTTAAAATGGTAA  
\*\*\*\*\*

14CSR TTTTATCTGTAATTCCTTTTTCAATGTATTTGTTTAGCATAGTTACCGAATCTTAGTTGC  
670 TTTTATCTGTAATTCCTTTTTCAATGTATTTGTTTAGCATAGTTACCGAATCTTAGTTGC  
6BF TTTTATCTGTAATTCCTTTTTCAATGTATTTGTTTAGCATAGTTACCGAATCTTAGTTGC  
6BSP TTTTATCTGTAATTCCTTTTTCAATGTATTTGTTTAGCATAGTTACCGAATCTTAGTTGC  
19AH TTTTATCTGTAATTCCTTTTTCAATGTATTTGTTTAGCATAGTTACCGAATCTTAGTTGC  
23FPO TTTTATCTGTAATTCCTTTTTCAATGTATTTGTTTAGCATAGTTACCGAATCTTAGTTGC  
19FTW TTTTATCTGTAATTCCTTTTTCAATGTATTTGTTTAGCATAGTTACCGAATCTTAGTTGC  
9VSP TTTTATCTGTAATTCCTTTTTCAATGTATTTGTTTAGCATAGTTACCGAATCTTAGTTGC  
TIGR4 TTTTATCTGTAATTCCTTTTTCAATGTATTTGTTTAGCATAGTTACCGAATCTTAGTTGC  
23FTW TTTTATCTGTAATTCCTTTTTCAATGTATTTGTTTAGCATAGTTACCGAATCTTAGTTGC  
\*\*\*\*\*

Figure 196F

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14CSR ATATAGATAATTTTAATTATTATAATACAAAAGAACTAATTGTCTTGTCAAAAAGGTTG  
670 ATATAGATAATTTTAATTATTATAATACAAAAGAACTAATTGTCTTGTCAAAAAGGTTG  
6BF ATATAGATAATTTTAATTATTATAATACAAAAGAACTAATTGTCTTGTCAAAAAGGTTG  
6BSP ATATAGATAATTTTAATTATTATAATACAAAAGAACTAATTGTCTTGTCAAAAAGGTTG  
19AH ATATAGATAATTTTAATTATTATAATACAAAAGAACTAATTGTCTTGTCAAAAAGGTTG  
23FPO ATATAGATAATTTTAATTATTATAATACAAAAGAACTAATTGTCTTGTCAAAAAGGTTG  
19FTW ATATAGATAATTTTAATTATTATAATACAAAAGAACTAATTGTCTTGTCAAAAAGGTTG  
9VSP ATATAGATAATTTTAATTATTATAATACAAAAGAACTAATTGTCTTGTCAAAAAGGTTG  
TIGR4 ATATAGATAATTTTAATTATTATAATACAAAAGAACTAATTGTCTTGTCAAAAAGGTTG  
23FTW ATATAGATAATTTTAATTATTATAATACAAAAGAACTAATTGTCTTGTCAAAAAGGTTG  
\*\*\*\*\*

14CSR TGGAATTTCCGACTTTATTGATAAAACAGCATGTAATAAAAGGCATTTTAAAGATAGTAA  
670 TGGAATTTCCGACTTTATTGATAAAACAGCATGTAATAAAAGGCATTTTAAAGATAGTAA  
6BF TGGAATTTCCGACTTTATTGATAAAACAGCATGTAATAAAAGGCATTTTAAAGATAGTAA  
6BSP TGGAATTTCCGACTTTATTGATAAAACAGCATGTAATAAAAGGCATTTTAAAGATAGTAA  
19AH TGGAATTTCCGACTTTATTGATAAAACAGCATGTAATAAAAGGCATTTTAAAGATAGTAA  
23FPO TGGAATTTCCGACTTTATTGATAAAACAGCATGTAATAAAAGGCATTTTAAAGATAGTAA  
19FTW TGGAATTTCCGACTTTATTGATAAAACAGCATGTAATAAAAGGCATTTTAAAGATAGTAA  
9VSP TGGAATTTCCGACTTTATTGATAAAACAGCATGTAATAAAAGGCATTTTAAAGATAGTAA  
TIGR4 TGGAATTTCCGACTTTATTGATAAAACAGCATGTAATAAAAGGCATTTTAAAGATAGTAA  
23FTW TGGAATTTCCGACTTTATTGATAAAACAGCATGTAATAAAAGGCATTTTAAAGATAGTAA  
\*\*\*\*\*

14CSR TGAGTATTGGTGGAGTTTATGGCTTATTTTTTTTATTAGAAAATATTTTTTTATCAAAAT  
670 TGAGTATTGGTGGAGTTTATGGCTTATTTTTTTTATTAGAAAATATTTTTTTATCAAAAT  
6BF TGAGTATTGGTGGAGTTTATGGCTTATTTTTTTTATTAGAAAATATTTTTTTATCAAAAT  
6BSP TGAGTATTGGTGGAGTTTATGGCTTATTTTTTTTATTAGAAAATATTTTTTTATCAAAAT  
19AH TGAGTATTGGTGGAGTTTATGGCTTATTTTTTTTATTAGAAAATATTTTTTTATCAAAAT  
23FPO TGAGTATTGGTGGAGTTTATGGCTTATTTTTTTTATTAGAAAATATTTTTTTATCAAAAT  
19FTW TGAGTATTGGTGGAGTTTATGGCTTATTTTTTTTATTAGAAAATATTTTTTTATCAAAAT  
9VSP TGAGTATTGGTGGAGTTTATGGCTTATTTTTTTTATTAGAAAATATTTTTTTATCAAAAT  
TIGR4 TGAGTATTGGTGGAGTTTATGGCTTATTTTTTTTATTAGAAAATATTTTTTTATCAAAAT  
23FTW TGAGTATTGGTGGAGTTTATGGCTTATTTTTTTTATTAGAAAATATTTTTTTATCAAAAT  
\*\*\*\*\*

14CSR ATTGTCGTTCTATAAAAAAATATGTGATAAAAAATATCTATTGTGATGGAAGTTGTTTTAA  
670 ATTGTCGTTCTATAAAAAAATATGTGATAAAAAATATCTATTGTGATGGAAGTTGTTTTAA  
6BF ATTGTCGTTCTATAAAAAAATATGTGATAAAAAATATCTATTGTGATGGAAGTTGTTTTAA  
6BSP ATTGTCGTTCTATAAAAAAATATGTGATAAAAAATATCTATTGTGATGGAAGTTGTTTTAA  
19AH ATTGTCGTTCTATAAAAAAATATGTGATAAAAAATATCTATTGTGATGGAAGTTGTTTTAA  
23FPO ATTGTCGTTCTATAAAAAAATATGTGATAAAAAATATCTATTGTGATGGAAGTTGTTTTAA  
19FTW ATTGTCGTTCTATAAAAAAATATGTGATAAAAAATATCTATTGTGATGGAAGTTGTTTTAA  
9VSP ATTGTCGTTCTATAAAAAAATATGTGATAAAAAATATCTATTGTGATGGAAGTTGTTTTAA  
TIGR4 ATTGTCGTTCTATAAAAAAATATGTGATAAAAAATATCTATTGTGATGGAAGTTGTTTTAA  
23FTW ATTGTCGTTCTATAAAAAAATATGTGATAAAAAATATCTATTGTGATGGAAGTTGTTTTAA  
\*\*\*\*\*

14CSR TTTATACTAGGATAGTTAATAGTAATACTATACTATACTATATTGTATACAAGTGTGTCA  
670 TTTATACTAGGATAGTTAATAGTAATACTATACTATACTATATTGTATACAAGTGTGTCA  
6BF TTTATACTAGGATAGTTAATAGTAATACTATACTATACTATATTGTATACAAGTGTGTCA  
6BSP TTTATACTAGGATAGTTAATAGTAATACTATACTATACTATATTGTATACAAGTGTGTCA  
19AH TTTATACTAGGATAGTTAATAGTAATACTATACTATACTATATTGTATACAAGTGTGTCA  
23FPO TTTATACTAGGATAGTTAATAGTAATACTATACTATACTATATTGTATACAAGTGTGTCA  
19FTW TTTATACTAGGATAGTTAATAGTAATACTATACTATACTATATTGTATACAAGTGTGTCA  
9VSP TTTATACTAGGATAGTTAATAGTAATACTATACTATACTATATTGTATACAAGTGTGTCA  
TIGR4 TTTATACTAGGATAGTTAATAGTAATACTATACTATACTATATTGTATACAAGTGTGTCA  
23FTW TTTATACTAGGATAGTTAATAGTAATACTATACTATACTA-----TATTGTATACAAGTGTGTCA  
\*\*\*\*\*

Figure 196G

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14CSR TTGCCAGGTTGAGAAGATAGCTATAACGCACCTTTTATACGCTTTTGCTACGTTTGTAGT  
670 TTGCCAGGTTGAGAAGATAGCTATAACGCACCTTTTATACGCTTTTGCTACGTTTGTAGT  
6BF TTGCCAGGTTGAGAAGATAGCTATAACGCACCTTTTATACGCTTTTGCTACGTTTGTAGT  
6BSP TTGCCAGGTTGAGAAGATAGCTATAACGCACCTTTTATACGCTTTTGCTACGTTTGTAGT  
19AH TTGCCAGGTTGAGAAGATAGCTATAACGCACCTTTTATACGCTTTTGCTACGTTTGTAGT  
23FPO TTGCCAGGTTGAGAAGATAGCTATAACGCACCTTTTATACGCTTTTGCTACGTTTGTAGT  
19FTW TTGCCAGGTTGAGAAGATAGCTATAACGCACCTTTTATACGCTTTTGCTACGTTTGTAGT  
9VSP TTGCCAGGTTGAGAAGATAGCTATAACGCACCTTTTATACGCTTTTGCTACGTTTGTAGT  
TIGR4 TTGCCAGGTTGAGAAGATAGCTATAACGCACCTTTTATACGCTTTTGCTACGTTTGTAGT  
23FTW TTGCCAGGTTGAGAAGATAGCTATAACGCACCTTTTATACGCTTTTGCTACGTTTGTAGT  
\*\*\*\*\*

14CSR GAACGGATTAACCTCAG--TGAGATAAATTTTATCAGAACATAAGTAATCCGTTTCTTCGT  
670 GAACGGATTAACCTCAG--TGAGATAAATTTTATCAGAACATAAGTAATCCGTTTCTTCGT  
6BF GAACGGATTAACCTCAG--TGAGATAAATTTTATCAGAACATAAGTAATCCGTTTCTTCGT  
6BSP GAACGGATTAACCTCAG--TGAGATAAATTTTATCAGAACATAAGTAATCCGTTTCTTCGT  
19AH GAACGGATTAACCTCAGCATGAGATAAATTTTATCAGAA--TAAGTAATCCGTTTCTTCGT  
23FPO GAACGGATTAACCTCAGCATGAGATAAATTTTATCAGAA--TAAGTAATCCGTTTCTTCGT  
19FTW GAACGGATTAACCTCAG--TGAGATAAATTTTATCAGAACATAAGTAATCCGTTTCTTCGT  
9VSP GAACGGATTAACCTCAG--TGAGATAAATTTTATCAGAACATAAGTAATCCGTTTCTTCGT  
TIGR4 GAACGGATTAACCTCAG--TGAGATAAATTTTATCAGAACATAAGTAATCCGTTTCTTCGT  
23FTW GAACGGATTAACCTCAG--TGAGATAAATTTTATCAGAACATAAGTAATCCGTTTCTTCGT  
\*\*\*\*\*

14CSR GTATACAGATTGAAAGTACCTATGAATCATAGAAGGATTAACCTGTTCTATGAATAATGC  
670 GTATACAGATTGAAAGTACCTATGAATCATAGAAGGATTAACCTGTTCTATGAATAATGC  
6BF GTATACAGATTGAAAGTACCTATGAATCATAGAAGGATTAACCTGTTCTATGAATAATGC  
6BSP GTATACAGATTGAAAGTACCTATGAATCATAGAAGGATTAACCTGTTCTATGAATAATGC  
19AH GTATACAGATTGAAAGTACCTATGAATCATAGAAGGATTAACCTGTTCTATGAATAATGC  
23FPO GTATACAGATTGAAAGTACCTATGAATCATAGAAGGATTAACCTGTTCTATGAATAATGC  
19FTW GTATACAGATTGAAAGTACCTATGAATCATAGAAGGATTAACCTGTTCTATGAATAATGC  
9VSP GTATACAGATTGAAAGTACCTATGAATCATAGAAGGATTAACCTGTTCTATGAATAATGC  
TIGR4 GTATACAGATTGAAAGTACCTATGAATCATAGAAGGATTAACCTGTTCTATGAATAATGC  
23FTW GTATACAGATTGAAAGTACCTATGAATCATAGAAGGATTAACCTGTTCTATGAATAATGC  
\*\*\*\*\*

14CSR TTAACAGGGAGACACACATGAAAAAAGTAAGAAAGATATTTTTCAGAAAGGCAGTTGCAGGAC  
670 TTAACAGGGAGACACACATGAAAAAAGTAAGAAAGATATTTTTCAGAAAGGCAGTTGCAGGAC  
6BF TTAACAGGGAGACACACATGAAAAAAGTAAGAAAGATATTTTTCAGAAAGGCAGTTGCAGGAC  
6BSP TTAACAGGGAGACACACATGAAAAAAGTAAGAAAGATATTTTTCAGAAAGGCAGTTGCAGGAC  
19AH TTAACAGGGAGACACACATGAAAAAAGTAAGAAAGATATTTTTCAGAAAGGCAGTTGCAGGAC  
23FPO TTAACAGGGAGACACACATGAAAAAAGTAAGAAAGATATTTTTCAGAAAGGCAGTTGCAGGAC  
19FTW TTAACAGGGAGACACACATGAAAAAAGTAAGAAAGATATTTTTCAGAAAGGCAGTTGCAGGAC  
9VSP TTAACAGGGAGACACACATGAAAAAAGTAAGAAAGATATTTTTCAGAAAGGCAGTTGCAGGAC  
TIGR4 TTAACAGGGAGACACACATGAAAAAAGTAAGAAAGATATTTTTCAGAAAGGCAGTTGCAGGAC  
23FTW TTAACAGGGAGACACACATGAAAAAAGTAAGAAAGATATTTTTCAGAAAGGCAGTTGCAGGAC  
\*\*\*\*\*

14CSR TGTGCTGTATATCTCAGTTGACAGCTTTTCTTCGATAGTTGCTTTAGCAGAAACGCCTG  
670 TGTGCTGTATATCTCAGTTGACAGCTTTTCTTCGATAGTTGCTTTAGCAGAAACGCCTG  
6BF TGTGCTGTATATCTCAGTTGACAGCTTTTCTTCGATAGTTGCTTTAGCAGAAACGCCTG  
6BSP TGTGCTGTATATCTCAGTTGACAGCTTTTCTTCGATAGTTGCTTTAGCAGAAACGCCTG  
19AH TGTGCTGTATATCTCAGTTGACAGCTTTTCTTCGATAGTTGCTTTAGCAGAAACGCCTG  
23FPO TGTGCTGTATATCTCAGTTGACAGCTTTTCTTCGATAGTTGCTTTAGCAGAAACGCCTG  
19FTW TGTGCTGTATATCTCAGTTGACAGCTTTTCTTCGATAGTTGCTTTAGCAGAAACGCCTG  
9VSP TGTGCTGTATATCTCAGTTGACAGCTTTTCTTCGATAGTTGCTTTAGCAGAAACGCCTG  
TIGR4 TGTGCTGTATATCTCAGTTGACAGCTTTTCTTCGATAGTTGCTTTAGCAGAAACGCCTG  
23FTW TGTGCTGTATATCTCAGTTGACAGCTTTTCTTCGATAGTTGCTTTAGCAGAAACGCCTG  
\*\*\*\*\*

Figure 196H

PCT/US05/27239

14CSR AAACCCAGTCCAGCGATAGGAAAAGTAGTGATTAAGGAGACAGGCGAAGGAGGAGCGCTTC  
670 AAACCCAGTCCAGCGATAGGAAAAGTAGTGATTAAGGAGACAGGCGAAGGAGGAGCGCTTC  
6BF AAACCCAGTCCAGCGATAGGAAAAGTAGTGATTAAGGAGACAGGCGAAGGAGGAGCGCTTC  
6BSP AAACCCAGTCCAGCGATAGGAAAAGTAGTGATTAAGGAGACAGGCGAAGGAGGAGCGCTTC  
19AH AAACCCAGTCCAGCGATAGGAAAAGTAGTGATTAAGGAGACAGGCGAAGGAGGAGCGCTTC  
23FPO AAACCCAGTCCAGCGATAGGAAAAGTAGTGATTAAGGAGACAGGCGAAGGAGGAGCGCTTC  
19FTW AAACCCAGTCCAGCGATAGGAAAAGTAGTGATTAAGGAGACAGGCGAAGGAGGAGCGCTTC  
9VSP AAACCCAGTCCAGCGATAGGAAAAGTAGTGATTAAGGAGACAGGCGAAGGAGGAGCGCTTC  
TIGR4 AAACCCAGTCCAGCGATAGGAAAAGTAGTGATTAAGGAGACAGGCGAAGGAGGAGCGCTTC  
23FTW AAACCCAGTCCAGCGATAGGAAAAGTAGTGATTAAGGAGACAGGCGAAGGAGGAGCGCTTC  
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14CSR TAGGAGATGCCGTCTTTGAGTTGAAAAACAATACGGATGGCACAACCTGTTTCGCAAAGGA  
670 TAGGAGATGCCGTCTTTGAGTTGAAAAACAATACGGATGGCACAACCTGTTTCGCAAAGGA  
6BF TAGGAGATGCCGTCTTTGAGTTGAAAAACAATACGGATGGCACAACCTGTTTCGCAAAGGA  
6BSP TAGGAGATGCCGTCTTTGAGTTGAAAAACAATACGGATGGCACAACCTGTTTCGCAAAGGA  
19AH TAGGAGATGCCGTCTTTGAGTTGAAAAACAATACGGATGGCACAACCTGTTTCGCAAAGGA  
23FPO TAGGAGATGCCGTCTTTGAGTTGAAAAACAATACGGATGGCACAACCTGTTTCGCAAAGGA  
19FTW TAGGAGATGCCGTCTTTGAGTTGAAAAACAATACGGATGGCACAACCTGTTTCGCAAAGGA  
9VSP TAGGAGATGCCGTCTTTGAGTTGAAAAACAATACGAATGGCACAACCTGTTTCGCAAAGGA  
TIGR4 TAGGAGATGCCGTCTTTGAGTTGAAAAACAATACGGATGGCACAACCTGTTTCGCAAAGGA  
23FTW TAGGAGATGCCGTCTTTGAGTTGAAAAACAATACGGATGGCACAACCTGTTTCGCAAAGGA  
\*\*\*\*\*

14CSR CAGAGGCGCAAAACAGGAGAAGCGATATTTTCAAACATAAAACCTGGGACATACACCTTGA  
670 CAGAGGCGCAAAACAGGAGAAGCGATATTTTCAAACATAAAACCTGGGACATACACCTTGA  
6BF CAGAGGCGCAAAACAGGAGAAGCGATATTTTCAAACATAAAACCTGGGACATACACCTTGA  
6BSP CAGAGGCGCAAAACAGGAGAAGCGATATTTTCAAACATAAAACCTGGGACATACACCTTGA  
19AH CAGAGGCGCAAAACAGGAGAAGCGATATTTTCAAACATAAAACCTGGGACATACACCTTGA  
23FPO CAGAGGCGCAAAACAGGAGAAGCGATATTTTCAAACATAAAACCTGGGACATACACCTTGA  
19FTW CAGAGGCGCAAAACAGGAGAAGCGATATTTTCAAACATAAAACCTGGGACATACACCTTGA  
9VSP CAGAGGCGCAAAACAGGAGAAGCGATATTTTCAAACATAAAACCTGGGACATACACCTTGA  
TIGR4 CAGAGGCGCAAAACAGGAGAAGCGATATTTTCAAACATAAAACCTGGGACATACACCTTGA  
23FTW CAGAGGCGCAAAACAGGAGAAGCGATATTTTCAAACATAAAACCTGGGACATACACCTTGA  
\*\*\*\*\*

14CSR CAGAAGCCCAACCTCCAGTTGGTTATAAACCTCTACTAAACAATGGACTGTTGAAGTTG  
670 CAGAAGCCCAACCTCCAGTTGGTTATAAACCTCTACTAAACAATGGACTGTTGAAGTTG  
6BF CAGAAGCCCAACCTCCAGTTGGTTATAAACCTCTACTAAACAATGGACTGTTGAAGTTG  
6BSP CAGAAGCCCAACCTCCAGTTGGTTATAAACCTCTACTAAACAATGGACTGTTGAAGTTG  
19AH CAGAAGCCCAACCTCCAGTTGGTTATAAACCTCTACTAAACAATGGACTGTTGAAGTTG  
23FPO CAGAAGCCCAACCTCCAGTTGGTTATAAACCTCTACTAAACAATGGACTGTTGAAGTTG  
19FTW CAGAAGCCCAACCTCCAGTTGGTTATAAACCTCTACTAAACAATGGACTGTTGAAGTTG  
9VSP CAGAAGCCCAACCTCCAGTTGGTTATAAACCTCTACTAAACAACGGACTGTTGAAGTTG  
TIGR4 CAGAAGCCCAACCTCCAGTTGGTTATAAACCTCTACTAAACAATGGACTGTTGAAGTTG  
23FTW CAGAAGCCCAACCTCCAGTTGGTTATAAACCTCTACTAAACAATGGACTGTTGAAGTTG  
\*\*\*\*\*

14CSR AGAAGAATGGTTCGGACGACTGTCCAAGGTGAACAGGTAGAAAATCGAGAAGAGGCTCTAT  
670 AGAAGAATGGTTCGGACGACTGTCCAAGGTGAACAGGTAGAAAATCGAGAAGAGGCTCTAT  
6BF AGAAGAATGGTTCGGACGACTGTCCAAGGTGAACAGGTAGAAAATCGAGAAGAGGCTCTAT  
6BSP AGAAGAATGGTTCGGACGACTGTCCAAGGTGAACAGGTAGAAAATCGAGAAGAGGCTCTAT  
19AH AGAAGAATGGTTCGGACGACTGTCCAAGGTGAACAGGTAGAAAATCGAGAAGAGGCTCTAT  
23FPO AGAAGAATGGTTCGGACGACTGTCCAAGGTGAACAGGTAGAAAATCGAGAAGAGGCTCTAT  
19FTW AGAAGAATGGTTCGGACGACTGTCCAAGGTGAACAGGTAGAAAATCGAGAAGAGGCTCTAT  
9VSP AGAAGAATGGTTCGGACGACTGTCCAAGGTGAACAGGTAGAAAATCGAGAAGAGGCTCTAT  
TIGR4 AGAAGAATGGTTCGGACGACTGTCCAAGGTGAACAGGTAGAAAATCGAGAAGAGGCTCTAT  
23FTW AGAAGAATGGTTCGGACGACTGTCCAAGGTGAACAGGTAGAAAATCGAGAAGAGGCTCTAT  
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14CSR CTGACCAGTATCCACAAACAGGGACTTATCCAGATGTTCAAACACCTTATCAGATTATTA  
670 CTGACCAGTATCCACAAACAGGGACTTATCCAGATGTTCAAACACCTTATCAGATTATTA  
6BF CTGACCAGTATCCACAAACAGGGACTTATCCAGATGTTCAAACACCTTATCAGATTATTA  
6BSP CTGACCAGTATCCACAAACAGGGACTTATCCAGATGTTCAAACACCTTATCAGATTATTA  
19AH CTGACCAGTATCCACAAACAGGGACTTATCCAGATGTTCAAACACCTTATCAGATTATTA  
23FPO CTGACCAGTATCCACAAACAGGGACTTATCCAGATGTTCAAACACCTTATCAGATTATTA  
19FTW CTGACCAGTATCCACAAACAGGGACTTATCCAGATGTTCAAACACCTTATCAGATTATTA  
9VSP CTGACCAGTATCCACAAACAGGGACTTATCCAGATGTTCAAACACCTTATCAGATTATTA  
TIGR4 CTGACCAGTATCCACAAACAGGGACTTATCCAGATGTTCAAACACCTTATCAGATTATTA  
23FTW CTGACCAGTATCCACAAACAGGGACTTATCCAGATGTTCAAACACCTTATCAGATTATTA  
\*\*\*\*\*

14CSR AGGTAGATGGTTCGGAAAAAACGGACAGCACAAGGCGTTGAATCCGAATCCATATGAAC  
670 AGGTAGATGGTTCGGAAAAAACGGACAGCACAAGGCGTTGAATCCGAATCCATATGAAC  
6BF AGGTAGATGGTTCGGAAAAAACGGACAGCACAAGGCGTTGAATCCGAATCCATATGAAC  
6BSP AGGTAGATGGTTCGGAAAAAACGGACAGCACAAGGCGTTGAATCCGAATCCATATGAAC  
19AH AGGTAGATGGTTCGGAAAAAACGGACAGCACAAGGCGTTGAATCCGAATCCATATGAAC  
23FPO AGGTAGATGGTTCGGAAAAAACGGACAGCACAAGGCGTTGAATCCGAATCCATATGAAC  
19FTW AGGTAGATGGTTCGGAAAAAACGGACAGCACAAGGCGTTGAATCCGAATCCATATGAAC  
9VSP AGGTAGATGGTTCGGAAAAAACGGACAGCACAAGGCGTTGAATCCGAATCCATATGAAC  
TIGR4 AGGTAGATGGTTCGGAAAAAACGGACAGCACAAGGCGTTGAATCCGAATCCATATGAAC  
23FTW AGGTAGATGGTTCGGAAAAAACGGACAGCACAAGGCGTTGAATCCGAATCCATATGAAC  
\*\*\*\*\*

14CSR GTGTGATTCCAGAAGGTACACTTTCAAAGAGAATTTATCAAGTGAATAATTTGGATGATA  
670 GTGTGATTCCAGAAGGTACACTTTCAAAGAGAATTTATCAAGTGAATAATTTGGATGATA  
6BF GTGTGATTCCAGAAGGTACACTTTCAAAGAGAATTTATCAAGTGAATAATTTGGATGATA  
6BSP GTGTGATTCCAGAAGGTACACTTTCAAAGAGAATTTATCAAGTGAATAATTTGGATGATA  
19AH GTGTGATTCCAGAAGGTACACTTTCAAAGAGAATTTATCAAGTGAATAATTTGGATGATA  
23FPO GTGTGATTCCAGAAGGTACACTTTCAAAGAGAATTTATCAAGTGAATAATTTGGATGATA  
19FTW GTGTGATTCCAGAAGGTACACTTTCAAAGAGAATTTATCAAGTGAATAATTTGGATGATA  
9VSP GTGTGATTCCAGAAGGTACACTTTCAAAGAGAATTTATCAAGTGAATAATTTGGATGATA  
TIGR4 GTGTGATTCCAGAAGGTACACTTTCAAAGAGAATTTATCAAGTGAATAATTTGGATGATA  
23FTW GTGTGATTCCAGAAGGTACACTTTCAAAGAGAATTTATCAAGTGAATAATTTGGATGATA  
\*\*\*\*\*

14CSR ACCAATATGGAATCGAGTTGACGGTTAGTGGTAAAACGACGGTTGAAACGAAAGAAGCCT  
670 ACCAATATGGAATCGAGTTGACGGTTAGTGGTAAAACGACGGTTGAAACGAAAGAAGCCT  
6BF ACCAATATGGAATCGAGTTGACGGTTAGTGGTAAAACGACGGTTGAAACGAAAGAAGCCT  
6BSP ACCAATATGGAATCGAGTTGACGGTTAGTGGTAAAACGACGGTTGAAACGAAAGAAGCCT  
19AH ACCAATATGGAATCGAGTTGACGGTTAGTGGTAAAACGACGGTTGAAACGAAAGAAGCCT  
23FPO ACCAATATGGAATCGAATTGACGGTTAGTGGGAAAACAGTGTATGAACGAAAAGATAAGT  
19FTW ACCAATATGGAATCGAATTGACGGTTAGTGGGAAAACAGTGTATGAACGAAAAGATAAGT  
9VSP ACCAATATGGAATCGAATTGACGGTTAGTGGGAAAACAGTGTATGAACGAAAAGATAAGT  
TIGR4 ACCAATATGGAATCGAATTGACGGTTAGTGGGAAAACAGTGTATGAACGAAAAGATAAGT  
23FTW ACCAATATGGAATCGAATTGACGGTTAGTGGGAAAACAGTGTATGAACGAAAAGATAAGT  
\*\*\*\*\* \* \* \* \* \*

14CSR CTACTCCGCTAGATGTTGTTATTCTATTAGATAACTCCAATAGTATGAGTAATATTCGAC  
670 CTACTCCGCTAGATGTTGTTATTCTATTAGATAACTCCAATAGTATGAGTAATATTCGAC  
6BF CTACTCCGCTAGATGTTGTTATTCTATTAGATAACTCCAATAGTATGAGTAATATTCGAC  
6BSP CTACTCCGCTAGATGTTGTTATTCTATTAGATAACTCCAATAGTATGAGTAATATTCGAC  
19AH CTACTCCGCTAGATGTTGTTATTCTATTAGATAACTCCAATAGTATGAGTAATATTCGAC  
23FPO CTACTCCGCTAGATGTTGTTATTCTATTAGATAACTCCAATAGTATGAGTAATATTCGAC  
19FTW CTGTGCCGCTGGATGTCGTTATCTTGCTCGATAACTCAAATAGTATGAGTAACATTTCGAA  
9VSP CTGTGCCGCTGGATGTCGTTATCTTGCTCGATAACTCAAATAGTATGAGTAACATTTCGAA  
TIGR4 CTGTGCCGCTGGATGTCGTTATCTTGCTCGATAACTCAAATAGTATGAGTAACATTTCGAA  
23FTW CTGTGCCGCTGGATGTCGTTATCTTGCTCGATAACTCAAATAGTATGAGTAACATTTCGAA  
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Figure 196J

Figure 196K

PCT/US05/27239

404/487

14CSR CAGAGGAATTGAACAAAGACAAATTGATGTATCAATTGCGCGCGACTTTTACCCAGAAGG  
670 CAGAGGAATTGAACAAAGACAAATTGATGTATCAATTGCGCGCGACTTTTACCCAGAAGG  
6BF CAGAGGAATTGAACAAAGACAAATTGATGTATCAATTGCGCGCGACTTTTACCCAGAAGG  
6BSP CAGAGGAATTGAACAAAGACAAATTGATGTATCAATTGCGCGCGACTTTTACCCAGAAGG  
19AH CAGAGGAATTGAACAAAGACAAATTGATGTATCAATTGCGCGCGACTTTTACCCAGAAGG  
23FPO CAGAGGAATTGAACAAAGACAAATTGATGTATCAATTGCGCGCGACTTTTACCCAGAAGG  
19FTW CAGAAGATCATGATGGAATAGATTGATGTACCAATTGCGTGCCACTTTTACTCAGAAAG  
9VSP CAGAAGACCATGATGGAATAGATTGATGTACCAATTGCGTGCCACTTTTACTCAGAAAG  
TIGR4 CAGAAGACCATGATGGAATAGATTGATGTACCAATTGCGTGCCACTTTTACTCAGAAAG  
23FTW CAGAAGACCATGATGGAATAGATTGATGTACCAATTGCGTGCCACTTTTACTCAGAAAG  
\*\*\*\*\* \* \* \* \*  
14CSR CTTTGATGACCGCTGATGATATCTTGACAAAGCAGGCAAGACCAAACAGTAAAAAGGTTA  
670 CTTTGATGACCGCTGATGATATCTTGACAAAGCAGGCAAGACCAAACAGTAAAAAGGTTA  
6BF CTTTGATGACCGCTGATGATATCTTGACAAAGCAGGCAAGACCAAACAGTAAAAAGGTTA  
6BSP CTTTGATGACCGCTGATGATATCTTGACAAAGCAGGCAAGACCAAACAGTAAAAAGGTTA  
19AH CTTTGATGACCGCTGATGATATCTTGACAAAGCAGGCAAGACCAAACAGTAAAAAGGTTA  
23FPO CTTTGATGACCGCTGATGATATCTTGACAAAGCAGGCAAGACCAAACAGTAAAAAGGTTA  
19FTW CTTTGATGAAGGCAGATGAGATTTTGACACAACAAGCGAGACAAAATAGTCAAAAAGTCA  
9VSP CTTTGATGAAGGCCGATGAGATTTTGACACAACAAGCGAGACAAAATAGTCAAAAAGTCA  
TIGR4 CTTTGATGAAGGCAGATGAGATTTTGACACAACAAGCGAGACAAAATAGTCAAAAAGTCA  
23FTW CTTTGATGAAGGCAGATGAGATTTTGACACAACAAGCGAGACAAAATAGTCAAAAAGTCA  
\*\*\*\*\* \* \* \* \*  
14CSR TTTTCCACATTACAGATGGTGTTCGACTATGTCATATCCAATTAATTTTAAATATACAG  
670 TTTTCCACATTACAGATGGTGTTCGACTATGTCATATCCAATTAATTTTAAATATACAG  
6BF TTTTCCACATTACAGATGGTGTTCGACTATGTCATATCCAATTAATTTTAAATATACAG  
6BSP TTTTCCACATTACAGATGGTGTTCGACTATGTCATATCCAATTAATTTTAAATATACAG  
19AH TTTTCCACATTACAGATGGTGTTCGACTATGTCATATCCAATTAATTTTAAATATACAG  
23FPO TTTTCCACATTACAGATGGTGTTCGACTATGTCATATCCAATTAATTTTAAATATACAG  
19FTW TTTTCCATATTACGGATGGTGTCCCAACTATGTCGATCCGATTAATTTTAAATCATGCTA  
9VSP TTTTCCATATTACGGATGGTGTCCCAACTATGTCGATCCGATTAATTTTAAATCATGCTA  
TIGR4 TTTTCCATATTACGGATGGTGTCCCAACTATGTCGATCCGATTAATTTTAAATCATGCTA  
23FTW TTTTCCATATTACGGATGGTGTCCCAACTATGTCGATCCGATTAATTTTAAATCATGCTA  
\*\*\*\*\* \* \* \* \*  
14CSR GAACGACGCAATCGTACAGAAGCTCAGCTGAATA-ATTTTAAAGCAAAAACCTCCAAATAGT  
670 GAACGACGCAATCGTACAGAAGCTCAGCTGAATA-ATTTTAAAGCAAAAACCTCCAAATAGT  
6BF GAACGACGCAATCGTACAGAAGCTCAGCTGAATA-ATTTTAAAGCAAAAACCTCCAAATAGT  
6BSP GAACGACGCAATCGTACAGAAGCTCAGCTGAATA-ATTTTAAAGCAAAAACCTCCAAATAGT  
19AH GAACGACGCAATCGTACAGAAGCTCAGCTGAATA-ATTTTAAAGCAAAAACCTCCAAATAGT  
23FPO GAACGACGCAATCGTACAGAAGCTCAGCTGAATA-ATTTTAAAGCAAAAACCTCCAAATAGT  
19FTW CGTTTGCTCCATCATATCAAAATCAACTAAATGCATTTTTTTAGTAAAT-CTCCTAATAAA  
9VSP CGTTTGCTCCATCATATCAAAATCAACTAAATGCATTTTTTTAGTAAAT-CTCCTAATAAA  
TIGR4 CGTTTGCTCCATCATATCAAAATCAACTAAATGCATTTTTTTAGTAAAT-CTCCTAATAAA  
23FTW CGTTTGCTCCATCATATCAAAATCAACTAAATGCATTTTTTTAGTAAAT-CTCCTAATAAA  
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14CSR AGCGGGATATTACTGGAGGACTTTGTTACATGGTCAGCAGATGGTGAACATAAGATTGTT  
670 AGCGGGATATTACTGGAGGACTTTGTTACATGGTCAGCAGATGGTGAACATAAGATTGTT  
6BF AGCGGGATATTACTGGAGGACTTTGTTACATGGTCAGCAGATGGTGAACATAAGATTGTT  
6BSP AGCGGGATATTACTGGAGGACTTTGTTACATGGTCAGCAGATGGTGAACATAAGATTGTT  
19AH AGCGGGATATTACTGGAGGACTTTGTTACATGGTCAGCAGATGGTGAACATAAGATTGTT  
23FPO AGCGGGATATTACTGGAGGACTTTGTTACATGGTCAGCAGATGGTGAACATAAGATTGTT  
19FTW GATGGAATACTATTAAAGTGATTTTATTACGCAAGCAACTAGTGGAGAACATACAATTGTA  
9VSP GATGGAATACTATTAAAGTGATTTTATTACGCAAGCAACTAGTGGAGAACATACAATTGTA  
TIGR4 GATGGAATACTATTAAAGTGATTTTATTACGCAAGCAACTAGTGGAGAACATACAATTGTA  
23FTW GATGGAATACTATTAAAGTGATTTTATTACGCAAGCAACTAGTGGAGAACATACAATTGTA  
\* \* \* \* \*

Figure 196L



14CSR CGTGGAGATGGTGAAAGTTATCAGATGTTTACGAAGAAACCTGT-----AACAGACCAA  
670 CGTGGAGATGGTGAAAGTTATCAGATGTTTACGAAGAAACCTGT-----AACAGACCAA  
6BF CGTGGAGATGGTGAAAGTTATCAGATGTTTACGAAGAAACCTGT-----AACAGACCAA  
6BSP CGTGGAGATGGTGAAAGTTATCAGATGTTTACGAAGAAACCTGT-----AACAGACCAA  
19AH CGTGGAGATGGTGAAAGTTATCAGATGTTTACGAAGAAACCTGT-----AACAGACCAA  
23FPO CGTGGAGATGGTGAAAGTTATCAGATGTTTACGAAGAAACCTGT-----AACAGACCAA  
19FTW CGCGGAGATGGGCAAAAGTTACCAGATGTTTACAGATAAGACAGTTTTATGAAAAAGGTGCT  
9VSP CGCGGAGATGGGCAAAAGTTACCAGATGTTTACAGATAAGACAGTTTTATGAAAAAGGTGCT  
TIGR4 CGCGGAGATGGGCAAAAGTTACCAGATGTTTACAGATAAGACAGTTTTATGAAAAAGGTGCT  
23FTW CGCGGAGATGGGCAAAAGTTACCAGATGTTTACAGATAAGACAGTTTTATGAAAAAGGTGCT  
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14CSR TACGGAGTTCATCAAAAT---ACTTTCAATCACCTCCATGGAGCAGAGAGCTAAATTAGTT  
670 TACGGAGTTCATCAAAAT---ACTTTCAATCACCTCCATGGAGCAGAGAGCTAAATTAGTT  
6BF TACGGAGTTCATCAAAAT---ACTTTCAATCACCTCCATGGAGCAGAGAGCTAAATTAGTT  
6BSP TACGGAGTTCATCAAAAT---ACTTTCAATCACCTCCATGGAGCAGAGAGCTAAATTAGTT  
19AH TACGGAGTTCATCAAAAT---ACTTTCAATCACCTCCATGGAGCAGAGAGCTAAATTAGTT  
23FPO TACGGAGTTCATCAAAAT---ACTTTCAATCACCTCCATGGAGCAGAGAGCTAAATTAGTT  
19FTW CCTGCAGCTTTCCCAGTTAAACCTGAAAAATATTCTGAAATGAAGCGGCTGGTTTATGCA  
9VSP CCTGCAGCTTTCCCAGTTAAACCTGAAAAATATTCTGAAATGAAGCGGCTGGTTTATGCA  
TIGR4 CCTGCAGCTTTCCCAGTTAAACCTGAAAAATATTCTGAAATGAAGCGGCTGGTTTATGCA  
23FTW CCTGCAGCTTTCCCAGTTAAACCTGAAAAATATTCTGAAATGAAGCGGCTGGTTTATGCA  
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14CSR TCAGCGGGATATAGGTTCTATGGAACCTGACTTGTATTTATATTGGCGTGATAGTATTCTA  
670 TCAGCGGGATATAGGTTCTATGGAACCTGACTTGTATTTATATTGGCGTGATAGTATTCTA  
6BF TCAGCGGGATATAGGTTCTATGGAACCTGACTTGTATTTATATTGGCGTGATAGTATTCTA  
6BSP TCAGCGGGATATAGGTTCTATGGAACCTGACTTGTATTTATATTGGCGTGATAGTATTCTA  
19AH TCAGCGGGATATAGGTTCTATGGAACCTGACTTGTATTTATATTGGCGTGATAGTATTCTA  
23FPO TCAGCGGGATATAGGTTCTATGGAACCTGACTTGTATTTATATTGGCGTGATAGTATTCTA  
19FTW GTTTATAGGCGATCCAATTAATGGTGGATATATTGGCTTAATTGGAGAGAGAGTATTCTG  
9VSP GTTTATAGGCGATCCAATTAATGGTGGATATATTGGCTTAATTGGAGAGAGAGTATTCTG  
TIGR4 GTTTATAGGCGATCCAATTAATGGTGGATATATTGGCTTAATTGGAGAGAGAGTATTCTG  
23FTW GTTTATAGGCGATCCAATTAATGGTGGATATATTGGCTTAATTGGAGAGAGAGTATTCTG  
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14CSR GCCTATCCATTTAACTCTAGTAGCCGATTGGATTACCAACCATGGTGACCCTACGACTTGG  
670 GCCTATCCATTTAACTCTAGTAGCCGATTGGATTACCAACCATGGTGACCCTACGACTTGG  
6BF GCCTATCCATTTAACTCTAGTAGCCGATTGGATTACCAACCATGGTGACCCTACGACTTGG  
6BSP GCCTATCCATTTAACTCTAGTAGCCGATTGGATTACCAACCATGGTGACCCTACGACTTGG  
19AH GCCTATCCATTTAACTCTAGTAGCCGATTGGATTACCAACCATGGTGACCCTACGACTTGG  
23FPO GCCTATCCATTTAACTCTAGTAGCCGATTGGATTACCAACCATGGTGACCCTACGACTTGG  
19FTW GCTTATCCGTTTAAATTCATAACTGCTAAAATTACCAATCATGGTGACCCTACAAGATGG  
9VSP GCTTATCCGTTTAAATTCATAACTGCTAAAATTACCAATCATGGTGACCCTACAAGATGG  
TIGR4 GCTTATCCGTTTAAATTCATAACTGCTAAAATTACCAATCATGGTGACCCTACAAGATGG  
23FTW GCTTATCCGTTTAAATTCATAACTGCTAAAATTACCAATCATGGTGACCCTACAAGATGG  
\* \* \* \* \*

14CSR TATTATAACGGAAATATGGCTCAGGATGGCTATGATGTCTTCACTGTTGGGGTTGGTGTA  
670 TATTATAACGGAAATATGGCTCAGGATGGCTATGATGTCTTCACTGTTGGGGTTGGTGTA  
6BF TATTATAACGGAAATATGGCTCAGGATGGCTATGATGTCTTCACTGTTGGGGTTGGTGTA  
6BSP TATTATAACGGAAATATGGCTCAGGATGGCTATGATGTCTTCACTGTTGGGGTTGGTGTA  
19AH TATTATAACGGAAATATGGCTCAGGATGGCTATGATGTCTTCACTGTTGGGGTTGGTGTA  
23FPO TATTATAACGGAAATATGGCTCAGGATGGCTATGATGTCTTCACTGTTGGGGTTGGTGTA  
19FTW TACTATAACGGGAATATTGCTCCTGATGGGTATGATGTCTTTACGGTAGGTATTGGTATT  
9VSP TACTATAACGGGAATATTGCTCCTGATGGGTATGATGTCTTTACGGTAGGTATTGGTATT  
TIGR4 TACTATAACGGGAATATTGCTCCTGATGGGTATGATGTCTTTACGGTAGGTATTGGTATT  
23FTW TACTATAACGGGAATATTGCTCCTGATGGGTATGATGTCTTTACGGTAGGTATTGGTATT  
\* \* \* \* \*

Figure 196M

14CSR AACCGGGGATCCTGGTACGGATGAAGCAACGGCTACTAGATTTATGCAGAGCATCTCTAGT  
670 AACCGGGGATCCTGGTACGGATGAAGCAACGGCTACTAGATTTATGCAGAGCATCTCTAGT  
6BF AACCGGGGATCCTGGTACGGATGAAGCAACGGCTACTAGATTTATGCAGAGCATCTCTAGT  
6BSP AACCGGGGATCCTGGTACGGATGAAGCAACGGCTACTAGATTTATGCAGAGCATCTCTAGT  
19AH AACCGGGGATCCTGGTACGGATGAAGCAACGGCTACTAGATTTATGCAGAGCATCTCTAGT  
23FPO AACCGGGGATCCTGGTACGGATGAAGCAACGGCTACTAGATTTATGCAGAGCATCTCTAGT  
19FTW AACCGGAGATCCTGGTACGGATGAAGCAACGGCTACTAGTTTTATGCAAAGTATTTCTAGT  
9VSP AACCGGAGATCCTGGTACGGATGAAGCAACGGCTACTAGTTTTATGCAAAGTATTTCTAGT  
TIGR4 AACCGGAGATCCTGGTACGGATGAAGCAACGGCTACTAGTTTTATGCAAAGTATTTCTAGT  
23FTW AACCGGAGATCCTGGTACGGATGAAGCAACGGCTACTAGTTTTATGCAAAGTATTTCTAGT  
\*\*\*\*\*

14CSR TCTCCTGACAACCTACACTAACGTAGCAGATCCATCTCAGATTTTACAAGAATTGAATCGC  
670 TCTCCTGACAACCTACACTAACGTAGCAGATCCATCTCAGATTTTACAAGAATTGAATCGC  
6BF TCTCCTGACAACCTACACTAACGTAGCAGATCCATCTCAGATTTTACAAGAATTGAATCGC  
6BSP TCTCCTGACAACCTACACTAACGTAGCAGATCCATCTCAGATTTTACAAGAATTGAATCGC  
19AH TCTCCTGACAACCTACACTAACGTAGCAGATCCATCTCAGATTTTACAAGAATTGAATCGC  
23FPO TCTCCTGACAACCTACACTAACGTAGCAGATCCATCTCAGATTTTACAAGAATTGAATCGC  
19FTW AAACCTGAAAACCTATACCAATGTTACTGACACGACAAAAATATTGGAACAGTTGAATCGT  
9VSP AAACCTGAAAACCTATACCAATGTTACTGACACGACAAAAATATTGGAACAGTTGAATCGT  
TIGR4 AAACCTGAAAACCTATACCAATGTTACTGACACGACAAAAATATTGGAACAGTTGAATCGT  
23FTW AAACCTGAAAACCTATACCAATGTTACTGACACGACAAAAATATTGGAACAGTTGAATCGT  
\*\*\*\*\*

14CSR TACTTCTATACTATCGTCAATGAGAAGAAATCTATCGAAAATGGTACGATTACAGACCCG  
670 TACTTCTATACTATCGTCAATGAGAAGAAATCTATCGAAAATGGTACGATTACAGACCCG  
6BF TACTTCTATACTATCGTCAATGAGAAGAAATCTATCGAAAATGGTACGATTACAGACCCG  
6BSP TACTTCTATACTATCGTCAATGAGAAGAAATCTATCGAAAATGGTACGATTACAGACCCG  
19AH TACTTCTATACTATCGTCAATGAGAAGAAATCTATCGAAAATGGTACGATTACAGACCCG  
23FPO TACTTCTATACTATCGTCAATGAGAAGAAATCTATCGAAAATGGTACGATTACAGACCCG  
19FTW TATTTCCACACCATCGTAACTGAAAAGAAATCAATTGAGAATGGTACGATTACAGATCCG  
9VSP TATTTCCACACCATCGTAACTGAAAAGAAATCAATTGAGAATGGTACGATTACAGATCCG  
TIGR4 TATTTCCACACCATCGTAACTGAAAAGAAATCAATTGAGAATGGTACGATTACAGATCCG  
23FTW TATTTCCACACCATCGTAACTGAAAAGAAATCAATTGAGAATGGTACGATTACAGATCCG  
\*\* \* \* \* \*

14CSR ATGGGTGAACTAATTGATTTCCAATTGGGAGCAGATGGAAGGTTTGATCCAGCGGATTAC  
670 ATGGGTGAACTAATTGATTTCCAATTGGGAGCAGATGGAAGGTTTGATCCAGCGGATTAC  
6BF ATGGGTGAACTAATTGATTTCCAATTGGGAGCAGATGGAAGGTTTGATCCAGCGGATTAC  
6BSP ATGGGTGAACTAATTGATTTCCAATTGGGAGCAGATGGAAGGTTTGATCCAGCGGATTAC  
19AH ATGGGTGAACTAATTGATTTCCAATTGGGAGCAGATGGAAGGTTTGATCCAGCGGATTAC  
23FPO ATGGGTGAACTAATTGATTTCCAATTGGGAGCAGATGGAAGGTTTGATCCAGCGGATTAC  
19FTW ATGGGTGAGTTAATTGATTTGCAATTGGGCACAGATGGAAGATTTGATCCAGCAGATTAC  
9VSP ATGGGTGAGTTAATTGATTTGCAATTGGGCACAGATGGAAGATTTGATCCAGCAGATTAC  
TIGR4 ATGGGTGAGTTAATTGATTTGCAATTGGGCACAGATGGAAGATTTGATCCAGCAGATTAC  
23FTW ATGGGTGAGTTAATTGATTTGCAATTGGGCACAGATGGAAGATTTGATCCAGCAGATTAC  
\*\*\*\*\*

14CSR ACTTTAACTGCAAACGATGGTAGTTCGTTGGTGAATAATGTCCCTACTGGGGGACCACAA  
670 ACTTTAACTGCAAACGATGGTAGTTCGTTGGTGAATAATGTCCCTACTGGGGGACCACAA  
6BF ACTTTAACTGCAAACGATGGTAGTTCGTTGGTGAATAATGTCCCTACTGGGGGACCACAA  
6BSP ACTTTAACTGCAAACGATGGTAGTTCGTTGGTGAATAATGTCCCTACTGGGGGACCACAA  
19AH ACTTTAACTGCAAACGATGGTAGTTCGTTGGTGAATAATGTCCCTACTGGGGGACCACAA  
23FPO ACTTTAACTGCAAACGATGGTAGTTCGTTGGTGAATAATGTCCCTACTGGGGGACCACAA  
19FTW ACTTTAACTGCAAACGATGGTAGTTCGTTGGTGAATAATGTCCCTACTGGGGGACCACAA  
9VSP ACTTTAACTGCAAACGATGGTAGTTCGTTGGTGAATAATGTCCCTACTGGGGGACCACAA  
TIGR4 ACTTTAACTGCAAACGATGGTAGTTCGTTGGTGAATAATGTCCCTACTGGGGGACCACAA  
23FTW ACTTTAACTGCAAACGATGGTAGTTCGTTGGTGAATAATGTCCCTACTGGGGGACCACAA  
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Figure 196N

14CSR AATGATGGTGGCTTGCTAAAAAATGCAAAAGTGTTCTATGATACGACTGAGAAAAGGATT  
670 AATGATGGTGGCTTGCTAAAAAATGCAAAAGTGTTCTATGATACGACTGAGAAAAGGATT  
6BF AATGATGGTGGCTTGCTAAAAAATGCAAAAGTGTTCTATGATACGACTGAGAAAAGGATT  
6BSP AATGATGGTGGCTTGCTAAAAAATGCAAAAGTGTTCTATGATACGACTGAGAAAAGGATT  
19AH AATGATGGTGGCTTGCTAAAAAATGCAAAAGTGTTCTATGATACGACTGAGAAAAGGATT  
23FPO AATGATGGTGGCTTGCTAAAAAATGCAAAAGTGTTCTATGATACGACTGAGAAAAGGATT  
19FTW AATGATGGTGGCTTGCTAAAAAATGCAAAAGTGTTCTATGATACGACTGAGAAAAGGATT  
9VSP AATGATGGTGGCTTGCTAAAAAATGCAAAAGTGTTCTATGATACGACTGAGAAAAGGATT  
TIGR4 AATGATGGTGGTTTGTAAAAAATGCAAAAGTGCTCTATGATACGACTGAGAAAAGGATT  
23FTW AATGATGGTGGTTTGTAAAAAATGCAAAAGTGCTCTATGATACGACTGAGAAAAGGATT  
\*\*\*\*\*  
14CSR CGTGTAACAGGTTTGTACCTTGAACGGGTGAAAAAGTTACATTGACTTATAATGTTTCGC  
670 CGTGTAACAGGTTTGTACCTTGAACGGGTGAAAAAGTTACATTGACTTATAATGTTTCGC  
6BF CGTGTAACAGGTTTGTACCTTGAACGGGTGAAAAAGTTACATTGACTTATAATGTTTCGC  
6BSP CGTGTAACAGGTTTGTACCTTGAACGGGTGAAAAAGTTACATTGACTTATAATGTTTCGC  
19AH CGTGTAACAGGTTTGTACCTTGAACGGGTGAAAAAGTTACATTGACTTATAATGTTTCGC  
23FPO CGTGTAACAGGTTTGTACCTTGAACGGGTGAAAAAGTTACATTGACTTATAATGTTTCGC  
19FTW CGTGTAACAGGTTTGTACCTTGAACGGGTGAAAAAGTTACATTGACTTATAATGTTTCGC  
9VSP CGTGTAACAGGTTTGTACCTTGAACGGGTGAAAAAGTTACATTGACTTATAATGTTTCGC  
TIGR4 CGTGTAACAGGTTCTGTACCTTGAACGGGTGAAAAAGTTACGTTGACCTACAATGTTTCGT  
23FTW CGTGTAACAGGTTCTGTACCTTGAACGGGTGAAAAAGTTACGTTGACCTACAATGTTTCGT  
\*\*\*\*\*  
14CSR TTGAATGACCAATTTGTAAGCAATAAATTCTATGACACGAATGGTCGAACAACCCCTACAC  
670 TTGAATGACCAATTTGTAAGCAATAAATTCTATGACACGAATGGTCGAACAACCCCTACAC  
6BF TTGAATGACCAATTTGTAAGCAATAAATTCTATGACACGAATGGTCGAACAACCCCTACAC  
6BSP TTGAATGACCAATTTGTAAGCAATAAATTCTATGACACGAATGGTCGAACAACCCCTACAC  
19AH TTGAATGACCAATTTGTAAGCAATAAATTCTATGACACGAATGGTCGAACAACCCCTACAC  
23FPO TTGAATGACCAATTTGTAAGCAATAAATTCTATGACACGAATGGTCGAACAACCCCTACAC  
19FTW TTGAATGACCAATTTGTAAGCAATAAATTCTATGACACGAATGGTCGAACAACCCCTACAC  
9VSP TTGAATGACCAATTTGTAAGCAATAAATTCTATGACACGAATGGTCGAACAACCCCTACAC  
TIGR4 TTGAATGATGAGTTTGTAGCAATAAATTTTATGATACCAATGGTCGAACAACCCCTACAT  
23FTW TTGAATGATGAGTTTGTAGCAATAAATTTTATGATACCAATGGTCGAACAACCCCTACAT  
\*\*\*\*\*  
14CSR CCTAAGGAAGTAGAAAAGAACACAGTGC GCGACTTCCCGATTCCCTAAGATTTCGTGATGTA  
670 CCTAAGGAAGTAGAAAAGAACACAGTGC GCGACTTCCCGATTCCCTAAGATTTCGTGATGTA  
6BF CCTAAGGAAGTAGAAAAGAACACAGTGC GCGACTTCCCGATTCCCTAAGATTTCGTGATGTA  
6BSP CCTAAGGAAGTAGAAAAGAACACAGTGC GCGACTTCCCGATTCCCTAAGATTTCGTGATGTA  
19AH CCTAAGGAAGTAGAAAAGAACACAGTGC GCGACTTCCCGATTCCCTAAGATTTCGTGATGTA  
23FPO CCTAAGGAAGTAGAAAAGAACACAGTGC GCGACTTCCCGATTCCCTAAGATTTCGTGATGTA  
19FTW CCTAAGGAAGTAGAAAAGAACACAGTGC GCGACTTCCCGATTCCCTAAGATTTCGTGATGTA  
9VSP CCTAAGGAAGTAGAAAAGAACACAGTGC GCGACTTCCCGATTCCCTAAGATTTCGTGATGTA  
TIGR4 CCTAAGGAAGTAGAACAGAACACAGTGC GCGACTTCCCGATTCCCTAAGATTTCGTGATGTA  
23FTW CCTAAGGAAGTAGAACAGAACACAGTGC GCGACTTCCCGATTCCCTAAGATTTCGTGATGTA  
\*\*\*\*\*  
14CSR CGAAAGTATCCAGAAATCACAATTC AAAAGAGAAAAAACTTGGTGAAATTGAGTTTATT  
670 CGAAAGTATCCAGAAATCACAATTC AAAAGAGAAAAAACTTGGTGAAATTGAGTTTATT  
6BF CGAAAGTATCCAGAAATCACAATTC AAAAGAGAAAAAACTTGGTGAAATTGAGTTTATT  
6BSP CGAAAGTATCCAGAAATCACAATTC AAAAGAGAAAAAACTTGGTGAAATTGAGTTTATT  
19AH CGAAAGTATCCAGAAATCACAATTC AAAAGAGAAAAAACTTGGTGAAATTGAGTTTATT  
23FPO CGAAAGTATCCAGAAATCACAATTC AAAAGAGAAAAAACTTGGTGAAATTGAGTTTATT  
19FTW CGAAATATCCAGCAATTACGATTGCAAAAGAGAAAAAACTTGGTGAAATTGAGTTTATT  
9VSP CGAAATATCCAGCAATTACGATTGCAAAAGAGAAAAAACTTGGTGAAATTGAGTTTATT  
TIGR4 CGGAAGTATCCAGAAATCACAATTC AAAAGAGAAAAAACTTGGTGACATTGAGTTTATT  
23FTW CGGAAGTATCCAGAAATCACAATTC AAAAGAGAAAAAACTTGGTGACATTGAGTTTATT  
\*\*\*\*\*

PCT/US05/27239 408/487

14CSR AAGATCAATAAGAATGATAAAAAACCACTGAGAGATGCGGTCTTTAGTCTTCAAAAACAA  
670 AAGATCAATAAGAATGATAAAAAACCACTGAGAGATGCGGTCTTTAGTCTTCAAAAACAA  
6BF AAGATCAATAAGAATGATAAAAAACCACTGAGAGATGCGGTCTTTAGTCTTCAAAAACAA  
6BSP AAGATCAATAAGAATGATAAAAAACCACTGAGAGATGCGGTCTTTAGTCTTCAAAAACAA  
19AH AAGATCAATAAGAATGATAAAAAACCACTGAGAGATGCGGTCTTTAGTCTTCAAAAACAA  
23FPO AAGATCAATAAGAATGATAAAAAACCACTGAGAGATGCGGTCTTTAGTCTTCAAAAACAA  
19FTW AAGATCAATAAGAATGATAAAAAACCACTGAGAGATGCGGTCTTTAGTCTTCAAAAACAA  
9VSP AAGATCAATAAGAATGATAAAAAACCACTGAGAGATGCGGTCTTTAGTCTTCAAAAACAA  
TIGR4 AAGGTCAATAAAAAATGATAAAAAACCACTGAGAGGTGCGGTCTTTAGTCTTCAAAAACAA  
23FTW AAGGTCAATAAAAAATGATAAAAAACCACTGAGAGATGCGGTCTTTAGTCTTCAAAAACAA  
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14CSR CATCCGGATTATCCAGATATTTATGGAGCTATTGATCAAAATGGCACTTATCAAAATGTG  
670 CATCCGGATTATCCAGATATTTATGGAGCTATTGATCAAAATGGCACTTATCAAAATGTG  
6BF CATCCGGATTATCCAGATATTTATGGAGCTATTGATCAAAATGGCACTTATCAAAATGTG  
6BSP CATCCGGATTATCCAGATATTTATGGAGCTATTGATCAAAATGGCACTTATCAAAATGTG  
19AH CATCCGGATTATCCAGATATTTATGGAGCTATTGATCAAAATGGCACTTATCAAAATGTG  
23FPO CATCCGGATTATCCAGATATTTATGGAGCTATTGATCAAAATGGCACTTATCAAAATGTG  
19FTW CATCCGGATTATCCAGATATTTATGGAGCTATTGATCAAAATGGCACTTATCAAAATGTG  
9VSP CATCCGGATTATCCAGATATTTATGGAGCTATTGATCAAAATGGCACTTATCAAAATGTG  
TIGR4 CATCCGGATTATCCAGATATTTATGGAGCTATTGATCAAAATGGCACTTATCAAAATGTG  
23FTW CATCCGGATTATCCAGATATTTATGGAGCTATTGATCAAAATGGCACTTATCAAAATGTG  
\*\*\*\*\*

14CSR AGAACAGGTGAAGATGGTAAGTTGACCTTTAAAAATCTGTGATGGGAAATATCGATTA  
670 AGAACAGGTGAAGATGGTAAGTTGACCTTTAAAAATCTGTGATGGGAAATATCGATTA  
6BF AGAACAGGTGAAGATGGTAAGTTGACCTTTAAAAATCTGTGATGGGAAATATCGATTA  
6BSP AGAACAGGTGAAGATGGTAAGTTGACCTTTAAAAATCTGTGATGGGAAATATCGATTA  
19AH AGAACAGGTGAAGATGGTAAGTTGACCTTTAAAAATCTGTGATGGGAAATATCGATTA  
23FPO AGAACAGGTGAAGATGGTAAGTTGACCTTTAAAAATCTGTGATGGGAAATATCGATTA  
19FTW AGAACAGGTGAAGATGGTAAGTTGACCTTTAAAAATCTGTGATGGGAAATATCGATTA  
9VSP AGAACAGGTGAAGATGGTAAGTTGACCTTTAAAAATCTGTGATGGGAAATATCGATTA  
TIGR4 AGAACAGGTGAAGATGGTAAGTTGACCTTTAAAAATCTGTGATGGGAAATATCGATTA  
23FTW AGAACAGGTGAAGATGGTAAGTTGACCTTTAAAAATCTGTGATGGGAAATATCGATTA  
\*\*\*\*\*

14CSR TTTGAAAATTCTGAACCACTGGTTATAAACCCGTTCAAATAAGCCTATCGTTGCCTTC  
670 TTTGAAAATTCTGAACCACTGGTTATAAACCCGTTCAAATAAGCCTATCGTTGCCTTC  
6BF TTTGAAAATTCTGAACCACTGGTTATAAACCCGTTCAAATAAGCCTATCGTTGCCTTC  
6BSP TTTGAAAATTCTGAACCACTGGTTATAAACCCGTTCAAATAAGCCTATCGTTGCCTTC  
19AH TTTGAAAATTCTGAACCACTGGTTATAAACCCGTTCAAATAAGCCTATCGTTGCCTTC  
23FPO TTTGAAAATTCTGAACCACTGGTTATAAACCCGTTCAAATAAGCCTATCGTTGCCTTC  
19FTW TTTGAAAATTCTGAACCACTGGTTATAAACCCGTTCAAATAAGCCTATCGTTGCCTTC  
9VSP TTTGAAAATTCTGAACCACTGGTTATAAACCCGTTCAAATAAGCCTATCGTTGCCTTC  
TIGR4 TTTGAAAATTCTGAACCACTGGTTATAAACCCGTTCAAATAAGCCTATCGTTGCCTTC  
23FTW TTTGAAAATTCTGAACCACTGGTTATAAACCCGTTCAAATAAGCCTATCGTTGCCTTC  
\*\*\*\*\*

14CSR CAAATAGTAAATGGAGAAGTCAGAGATGTGACTTCAATCGTTCCACAAGATATACCAGCG  
670 CAAATAGTAAATGGAGAAGTCAGAGATGTGACTTCAATCGTTCCACAAGATATACCAGCG  
6BF CAAATAGTAAATGGAGAAGTCAGAGATGTGACTTCAATCGTTCCACAAGATATACCAGCG  
6BSP CAAATAGTAAATGGAGAAGTCAGAGATGTGACTTCAATCGTTCCACAAGATATACCAGCG  
19AH CAAATAGTAAATGGAGAAGTCAGAGATGTGACTTCAATCGTTCCACAAGATATACCAGCG  
23FPO CAAATAGTAAATGGAGAAGTCAGAGATGTGACTTCAATCGTTCCACAAGATATACCAGCG  
19FTW CAAATAGTAAATGGAGAAGTCAGAGATGTGACTTCAATCGTTCCACAAGATATACCAGCG  
9VSP CAAATAGTAAATGGAGAAGTCAGAGATGTGACTTCAATCGTTCCACAAGATATACCAGCG  
TIGR4 CAAATAGTAAATGGAGAAGTCAGAGATGTGACTTCAATCGTTCCACAAGATATACCAGCG  
23FTW CAAATAGTAAATGGAGAAGTCAGAGATGTGACTTCAATCGTTCCACAAGATATACCAGCG  
\*\*\*\*\*

Figure 196P

PCT/US05/27239/409/487

14CSR GGTTACGAGTTTACGAATGATAAGCACTATATCACAAATGAGCCAATTCTCTCCAAAAAGA  
670 GGTTACGAGTTTACGAATGATAAGCACTATATCACAAATGAGCCAATTCTCTCCAAAAAGA  
6BF GGTTACGAGTTTACGAATGATAAGCACTATATCACAAATGAGCCAATTCTCTCCAAAAAGA  
6BSP GGTTACGAGTTTACGAATGATAAGCACTATATCACAAATGAGCCAATTCTCTCCAAAAAGA  
19AH GGTTACGAGTTTACGAATGATAAGCACTATATCACAAATGAGCCAATTCTCTCCAAAAAGA  
23FPO GGTTACGAGTTTACGAATGATAAGCACTATATCACAAATGAGCCAATTCTCTCCAAAAAGA  
19FTW GGTTACGAGTTTACGAATGATAAGCACTATATTACCAATGAACCTATTCTCTCCAAAGAGA  
9VSP GGTTACGAGTTTACGAATGATAAGCACTATATTACCAATGAACCTATTCTCTCCAAAGAGA  
TIGR4 GGTTACGAGTTTACGAATGATAAGCACTATATTACCAATGAACCTATTCTCTCCAAAGAGA  
23FTW GGTTACGAGTTTACGAATGATAAGCACTATATTACCAATGAACCTATTCTCTCCAAAGAGA  
\*\*\*\*\* \*\* \*\*\*\*\* \*\* \*\*\*\*\* \*\*

14CSR GAATATCCTCGAAGTGGTGGTATCGGAATGTTGCCATTCTATCTGATAGGTTGCATGATG  
670 GAATATCCTCGAAGTGGTGGTATCGGAATGTTGCCATTCTATCTGATAGGTTGCATGATG  
6BF GAATATCCTCGAAGTGGTGGTATCGGAATGTTGCCATTCTATCTGATAGGTTGCATGATG  
6BSP GAATATCCTCGAAGTGGTGGTATCGGAATGTTGCCATTCTATCTGATAGGTTGCATGATG  
19AH GAATATCCTCGAAGTGGTGGTATCGGAATGTTGCCATTCTATCTGATAGGTTGCATGATG  
23FPO GAATATCCTCGAAGTGGTGGTATCGGAATGTTGCCATTCTATCTGATAGGTTGCATGATG  
19FTW GAATATCCTCGAAGTGGTGGTATCGGAATGTTGCCATTCTATCTGATAGGTTGCATGATG  
9VSP GAATATCCTCGAAGTGGTGGTATCGGAATGTTGCCATTCTATCTGATAGGTTGCATGATG  
TIGR4 GAATATCCTCGAAGTGGTGGTATCGGAATGTTGCCATTCTATCTGATAGGTTGCATGATG  
23FTW GAATATCCTCGAAGTGGTGGTATCGGAATGTTGCCATTCTATCTGATAGGTTGCATGATG  
\*\*\*\*\* \*\*\*\*\*

14CSR ATGGGAGGAGTTCTATTATACACACGGAACATCCGTAAAGTGTAGCAATGAGAAATGAT  
670 ATGGGAGGAGTTCTATTATACACACGGAACATCCGTAAAGTGTAGCAATGAGAAATGAT  
6BF ATGGGAGGAGTTCTATTATACACACGGAACATCCGTAAAGTGTAGCAATGAGAAATGAT  
6BSP ATGGGAGGAGTTCTATTATACACACGGAACATCCGTAAAGTGTAGCAATGAGAAATGAT  
19AH ATGGGAGGAGTTCTATTATACACACGGAACATCCGTAAAGTGTAGCAATGAGAAATGAT  
23FPO ATGGGAGGAGTTCTATTATACACACGGAACATCCGTAAAGTGTAGCAATGAGAAATGAT  
19FTW ATGGGAGGAGTTCTATTATACACACGGAACATCCGTAAAGTGTAG-----AAATGAT  
9VSP ATGGGAGGAGTTCTATTATACACACGGAACATCCGTAAAGTGTAG-----AAATGAT  
TIGR4 ATGGGAGGAGTTCTATTATACACACGGAACATCCGTAAAGTGTAG-----AAATGAT  
23FTW ATGGGAGGAGTTCTATTATACACACGGAACATCCGTAAAGTGTAG-----AAATGAT  
\*\*\*\*\* \*\*\*\*\*

14CSR AATATCGATACTCTGAGCGATACTTTTAAGAAGTAGCACTCAAGAAGAGATTTAAGTTTA  
670 AATATCGATACTCTGAGCGATACTTTTAAGAAGTAGCACTCAAGAAGAGATTTAAGTTTA  
6BF AATATCGATACTCTGAGCGATACTTTTAAGAAGTAGCACTCAAGAAGAGATTTAAGTTTA  
6BSP AATATCGATACTCTGAGCGATACTTTTAAGAAGTAGCACTCAAGAAGAGATTTAAGTTTA  
19AH AATATCGATACTCTGAGCGATACTTTTAAGAAGTAGCACTCAAGAAGAGATTTAAGTTTA  
23FPO AATATCGATACTCTGAGCGATACTTTTAAGAAGTAGCACTCAAGAAGAGATTTAAGTTTA  
19FTW AATATCTATGTTCTGAACAATACTTTTAAGAAGTAGCACTCAAGAAGAGATTTAAGTTTA  
9VSP AATATCTATGTTCTGAACGATACTTTTAAGAAGTAGCACTCAAGAAGAGATTTAAGTTTA  
TIGR4 AATATCTATGTTCTGAACGATACTTTTAAGAAGTAGCACTCAAGAAGAGATTTAAGTTTA  
23FTW AATATCTATGTTCTGAACGATACTTTTAAGAAGTAGCACTCAAGAAGAGATTTAAGTTTA  
\*\*\*\*\* \*\* \*\*\*\*\* \* \*\*\*\*\*

14CSR CTTGGTGAAAACAGTTTCTTCGCCAAGTAAACCACCATTGAAAGGGGAGATGTTTTCGA  
670 CTTGGTGAAAACAGTTTCTTCGCCAAGTAAACCACCATTGAAAGGGGAGATGTTTTCGA  
6BF CTTGGTGAAAACAGTTTCTTCGCCAAGTAAACCACCATTGAAAGGGGAGATGTTTTCGA  
6BSP CTTGGTGAAAACAGTTTCTTCGCCAAGTAAACCACCATTGAAAGGGGAGATGTTTTCGA  
19AH CTTGGTGAAAACAGTTTCTTCGCCAAGTAAACCACCATTGAAAGGGGAGATGTTTTCGA  
23FPO CTTGGTGAAAACAGTTTCTTCGCCAAGTAAACCACCATTGAAAGGGGAGATGTTTTCGA  
19FTW CTTGGTGAAAACAGTTTCTTCGCCAAGTAAACCACCATTGAAAGGGGAGATGTTTTCGA  
9VSP CTTGGTGAAAACAGTTTCTTCGCCAAGTAAACCACCATTGAAAGGGGAGATGTTTTCGA  
TIGR4 CTTGGTGAAAACAGTTTCTTCGCCAAGTAAACCACCATTGAAAGGGGAGATGTTTTCGA  
23FTW CTTGGTGAAAACAGTTTCTTCGCCAAGTAAACCACCATTGAAAGGGGAGATGTTTTCGA  
\*\*\*\*\* \* \*\*\*\*\* \* \*\*\*\*\*

Figure 196Q

14CSR AAACCTGCACAGAAAAAAGGATTATTATTGTCATGTGTAATTCATTACATTGCTCACAGT  
670 AAACCTGCACAGAAAAAAGGATTATTATTGTCATGTGTAATTCATTACATTGCTCACAGT  
6BF AAACCTGCACAGAAAAAAGGATTATTATTGTCATGTGTAATTCATTACATTGCTCACAGT  
6BSP AAACCTGCACAGAAAAAAGGATTATTATTGTCATGTGTAATTCATTACATTGCTCACAGT  
19AH AAACCTGCACAGAAAAAAGGATTATTATTGTCATGTGTAATTCATTACATTGCTCACAGT  
23FPO AAACCTGCACAGAAAAAAGGATTATTATTGTCATGTGTAATTCATTACATTGCTCACAGT  
19FTW AAACCTGCACAGAAAAA--GGATTATTATTGTCATGTGTAATTCATTACATTGCTCACAGT  
9VSP AAACCTGCACAGAAAAA--GGATTATTATTGTCATGTGTAATTCATTACATTGCTCACAGT  
TIGR4 AAACCTGCACAGAAAAA--GGATTATTATTGTCATGTGTAATTCATTACATTGCTCACAGT  
23FTW AAACCTGCACAGAAAAA--GGATTATTATTGTCATGTGTAATTCATTACATTGCTCACAGT  
\*\*\*\*\*

14CSR TGATTTTAAGAGATATGAATAAGGAGAAATCATGAAATCAATCAACAAATTTTAAACAAT  
670 TGATTTTAAGAGATATGAATAAGGAGAAATCATGAAATCAATCAACAAATTTTAAACAAT  
6BF TGATTTTAAGAGATATGAATAAGGAGAAATCATGAAATCAATCAACAAATTTTAAACAAT  
6BSP TGATTTTAAGAGATATGAATAAGGAGAAATCATGAAATCAATCAACAAATTTTAAACAAT  
19AH TGATTTTAAGAGATATGAATAAGGAGAAATCATGAAATCAATCAACAAATTTTAAACAAT  
23FPO TGATTTTAAGAGATATGAATAAGGAGAAATCATGAAATCAATCAACAAATTTTAAACAAT  
19FTW TGATTTTAAGAGATA--AATAAGGAGAAATCATGAAATCAATCAACAAATTTTAAACAAT  
9VSP TGATTTTAAGAGATA--AATAAGGAGAAATCATGAAATCAATCAACAAATTTTAAACAAT  
TIGR4 TGATTTTAAGAGATATGAATAAGGAGAAATCATGAAATCAATCAACAAATTTTAAACAAT  
23FTW TGATTTTAAGAGATATGAATAAGGAGAAATCATGAAATCAATCAACAAATTTTAAACAAT  
\*\*\*\*\*

14CSR GCTTGCTGCCTTATTACTGACAGCGAGTAGCCTGTTTTAGCTGCAACAGTTTTTGC GGC  
670 GCTTGCTGCCTTATTACTGACAGCGAGTAGCCTGTTTTAGCTGCAACAGTTTTTGC GGC  
6BF GCTTGCTGCCTTATTACTGACAGCGAGTAGCCTGTTTTAGCTGCAACAGTTTTTGC GGC  
6BSP GCTTGCTGCCTTATTACTGACAGCGAGTAGCCTGTTTTAGCTGCAACAGTTTTTGC GGC  
19AH GCTTGCTGCCTTATTACTGACAGCGAGTAGCCTGTTTTAGCTGCAACAGTTTTTGC GGC  
23FPO GCTTGCTGCCTTATTACTGACAGCGAGTAGCCTGTTTTAGCTGCAACAGTTTTTGC GGC  
19FTW GCTTGCTGCCTTATTATTGACAGCGAGTAGCCTGTTTTAGCTGCAACAGTTTTTGC GGC  
9VSP GCTTGCTGCCTTATTACTGACAGCGAGTAGCCTGTTTTAGCTGCAACAGTTTTTGC GGC  
TIGR4 GCTTGCTGCCTTATTACTGACAGCGAGTAGCCTGTTTTAGCTGCAACAGTTTTTGC GGC  
23FTW ACTTGCTGCCTTATTACTGACAGCGAGTAGCCTGTTCTAGCTGCAACAGTTTTTGC GGC  
\*\*\*\*\*

14CSR GGACAATGTTAGTACAGCACCAGATGCTGTTACTAAAACCTTAAACAATCCATAAGTTACT  
670 GGACAATGTTAGTACAGCACCAGATGCTGTTACTAAAACCTTAAACAATCCATAAGTTACT  
6BF GGACAATGTTAGTACAGCACCAGATGCTGTTACTAAAACCTTAAACAATCCATAAGTTACT  
6BSP GGACAATGTTAGTACAGCACCAGATGCTGTTACTAAAACCTTAAACAATCCATAAGTTACT  
19AH GGACAATGTTAGTACAGCACCAGATGCTGTTACTAAAACCTTAAACAATCCATAAGTTACT  
23FPO GGACAATGTTAGTACAGCACCAGATGCTGTTACTAAAACCTTAAACAATCCATAAGTTACT  
19FTW TGG-GACGACA--ACAACATCTGTTACCGTTCATAAACTATTGGCAACAGATGGGGATAT  
9VSP TGG-GACGACA--ACAACATCTGTTACCGTTCATAAACTATTGGCAACAGATGGGGATAT  
TIGR4 TGG-GACGACA--ACAACATCTGTTACCGTTCATAAACTATTGGCAACAGATGGGGATAT  
23FTW GGA-ACAAAA--ACTAAGCACTTACAGTTCATAAATATTGATGACAGATCAAGAGCT  
\* \* \* \* \*

14CSR GCTCTCA---GAAGATGATTTAAAGACTTGGGATACAAACGGTCCTAA-AGGATATGATG  
670 GCTCTCA---GAAGATGATTTAAAGACTTGGGATACAAACGGTCCTAA-AGGATATGATG  
6BF GCTCTCA---GAAGATGATTTAAAGACTTGGGATACAAACGGTCCTAA-AGGATATGATG  
6BSP GCTCTCA---GAAGATGATTTAAAGACTTGGGATACAAACGGTCCTAA-AGGATATGATG  
19AH GCTCTCA---GAAGATGATTTAAAGACTTGGGATACAAACGGTCCTAA-AGGATATGATG  
23FPO GCTCTCA---GAAGATGATTTAAAGACTTGGGATACAAACGGTCCTAA-AGGATATGATG  
19FTW GGATAAAATTGCAATGAGTTAGAAACAGGTAACCTATGCTGGTAATAA-AGTGGGTGTTTC  
9VSP GGATAAAATTGCAATGAGTTAGAAACAGGTAACCTATGCTGGTAATAA-AGTGGGTGTTTC  
TIGR4 GGATAAAATTGCAATGAGTTAGAAACAGGTAACCTATGCTGGTAATAA-AGTGGGTGTTTC  
23FTW TGAC-----GCTTGAATTCTGATGCGATTACTACTGCAGGTTATGACGGTTCGCAAAA  
\* \* \* \* \*

Figure 196R

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14CSR      GAACTCAATCTAGTTTAAAAGATTTAACTGGAGTTGTAGCTG----AGGAAATTCCAAAT
670        GAACTCAATCTAGTTTAAAAGATTTAACTGGAGTTGTAGCTG----AGGAAATTCCAAAT
6BF        GAACTCAATCTAGTTTAAAAGATTTAACTGGAGTTGTAGCTG----AGGAAATTCCAAAT
6BSP       GAACTCAATCTAGTTTAAAAGATTTAACTGGAGTTGTAGCTG----AGGAAATTCCAAAT
19AH       GAACTCAATCTAGTTTAAAAGATTTAACTGGAGTTGTAGCTG----AGGAAATTCCAAAT
23FPO      GAACTCAATCTAGTTTAAAAGATTTAACTGGAGTTGTAGCTG----AGGAAATTCCAAAT
19FTW      TACCTGCA---AATGCAAAAGAAATTGCCGGTGTATGTTTCGTTTGGACAAATACTAATA
9VSP       TACCTGCA---AATGCAAAAGAAATTGCCGGTGTATGTTTCGTTTGGACAAATACTAATA
TIGR4      TACCTGCA---AATGCAAAAGAAATTGCCGGTGTATGTTTCGTTTGGACAAATACTAATA
23FTW      T-TTGAA---CAGTTCAAACAACCTCAAGGTGTTCCACAAG---GAGTAACCGAAATCT
          *  *          *** *  *  *  *  *  *  *  *  *  *

14CSR      GTATACTT-----TGAATTACAAAAGTATA-ATTTGACTGATGGT--AAGGAAAAAGA
670        GTATACTT-----TGAATTACAAAAGTATA-ATTTGACTGATGGT--AAGGAAAAAGA
6BF        GTATACTT-----TGAATTACAAAAGTATA-ATTTGACTGATGGT--AAGGAAAAAGA
6BSP       GTATACTT-----TGAATTACAAAAGTATA-ATTTGACTGATGGT--AAGGAAAAAGA
19AH       GTATACTT-----TGAATTACAAAAGTATA-ATTTGACTGATGGT--AAGGAAAAAGA
23FPO      GTATACTT-----TGAATTACAAAAGTATA-ATTTGACTGATGGT--AAGGAAAAAGA
19FTW      ATGAAATTATTGATGAAAATGGCCAACTCTAGGAGTGAATATTGATCCACAAACATTTA
9VSP       ATGAAATTATTGATGAAAATGGCCAACTCTAGGAGTGAATATTGATCCACAAACATTTA
TIGR4      ATGAAATTATTGATGAAAATGGCCAACTCTAGGAGTGAATATTGATCCACAAACATTTA
23FTW      CTGGTGTTCG--ATTTCGAGTTACAGAGTTATACGGGTCTCAAGGA--AAAGAACAAGAA
          *  **          *  *  *  *  *  *  *  *  *  *

14CSR      AAATCTTAAAGATGATAGTAAATGGACAACAGTTCATGGTGGTTTGACAACATAAGATGG
670        AAATCTTAAAGATGATAGTAAATGGACAACAGTTCATGGTGGTTTGACAACATAAGATGG
6BF        AAATCTTAAAGATGATAGTAAATGGACAACAGTTCATGGTGGTTTGACAACATAAGATGG
6BSP       AAATCTTAAAGATGATAGTAAATGGACAACAGTTCATGGTGGTTTGACAACATAAGATGG
19AH       AAATCTTAAAGATGATAGTAAATGGACAACAGTTCATGGTGGTTTGACAACATAAGATGG
23FPO      AAATCTTAAAGATGATAGTAAATGGACAACAGTTCATGGTGGTTTGACAACATAAGATGG
19FTW      AACTCTCAGGGGCAATGCCGGC--AACTGCAATGAAAAAATTAACAGAAGCTGAA---GG
9VSP       AACTCTCAGGGGCAATGCCGGC--AACTGCAATGAAAAAATTAACAGAAGCTGAA---GG
TIGR4      AACTCTCAGGGGCAATGCCGGC--AACTGCAATGAAAAAATTAACAGAAGCTGAA---GG
23FTW      AA-TTTAACGAATGATGCGGTTTGGACTGCGGTTAATAAAGGTGTGACAGCTGAAACGAGG
          ** *  *  *  *  *  *  *  *  *  *  *  *  *

14CSR      ACTTAAAAATTGAAACCAGTACTCTTAAAGGTGT---GTATCGTATTCGTGAGGATAGAAC
670        ACTTAAAAATTGAAACCAGTACTCTTAAAGGTGT---GTATCGTATTCGTGAGGATAGAAC
6BF        ACTTAAAAATTGAAACCAGTACTCTTAAAGGTGT---GTATCGTATTCGTGAGGATAGAAC
6BSP       ACTTAAAAATTGAAACCAGTACTCTTAAAGGTGT---GTATCGTATTCGTGAGGATAGAAC
19AH       ACTTAAAAATTGAAACCAGTACTCTTAAAGGTGT---GTATCGTATTCGTGAGGATAGAAC
23FPO      ACTTAAAAATTGAAACCAGTACTCTTAAAGGTGT---GTATCGTATTCGTGAGGATAGAAC
19FTW      AGCTAAATTTAACACGGCAAATTTACCAGCTGCTAAGTATAAAATTTATGAAATTCACAG
9VSP       AGCTAAATTTAACACGGCAAATTTACCAGCTGCTAAGTATAAAATTTATGAAATTCACAG
TIGR4      AGCTAAATTTAACACGGCAAATTTACCAGCTGCTAAGTATAAAATTTATGAAATTCACAG
23FTW      TGTAAATTTGATACTGAAGTTTACAAGGGAC---ATATCGTCTGTGCAAGTACGTAA
          **** *  *  *  *  *  *  *  *  *  *  *  *

14CSR      AAAGACTACCTATGTTGGTCCTAATGGGCAAGTATTAACAGGTTCAAAGCCGTACCTGC
670        AAAGACTACCTATGTTGGTCCTAATGGGCAAGTATTAACAGGTTCAAAGCCGTACCTGC
6BF        AAAGACTACCTATGTTGGTCCTAATGGGCAAGTATTAACAGGTTCAAAGCCGTACCTGC
6BSP       AAAGACTACCTATGTTGGTCCTAATGGGCAAGTATTAACAGGTTCAAAGCCGTACCTGC
19AH       AAAGACTACCTATGTTGGTCCTAATGGGCAAGTATTAACAGGTTCAAAGCCGTACCTGC
23FPO      AAAGACTACCTATGTTGGTCCTAATGGGCAAGTATTAACAGGTTCAAAGCCGTACCTGC
19FTW      TTTATCAACTTATGTCGGTGAAGATGGAGCAACCTTAACAGGTTCTAAAGCAGTTCCAAT
9VSP       TTTATCAACTTATGTCGGTGAAGATGGAGCAACCTTAACAGGTTCTAAAGCAGTTCCAAT
TIGR4      TTTATCAACTTATGTCGGTGAAGATGGAGCAACCTTAACAGGTTCTAAAGCAGTTCCAAT
23FTW      AGAATCGACTTATGTCGGTCCAAATGGTAAAGTTTAAACAGGTATGAAAGCTGTTCTCTGC
          *  *  *****  *  *  *  *  *  *  *  *  *  *

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Figure 196S

Figure 196T







Figure 196W

PCT/US2005/027239 416/487

14CSR TCTTACTTCTAATACGGATGGTCAATTCCAAATTTTCAGGTCTTGCTGCTGGTACTTATAA  
670 TCTTACTTCTAATACGGATGGTCAATTCCAAATTTTCAGGTCTTGCTGCTGGTACTTATAA  
6BF TCTTACTTCTAATACGGATGGTCAATTCCAAATTTTCAGGTCTTGCTGCTGGTACTTATAA  
6BSP TCTTACTTCTAATACGGATGGTCAATTCCAAATTTTCAGGTCTTGCTGCTGGTACTTATAA  
19AH TCTTACTTCTAATACGGATGGTCAATTCCAAATTTTCAGGTCTTGCTGCTGGTACTTATAA  
23FPO TCTTACTTCTAATACGGATGGTCAATTCCAAATTTTCAGGTCTTGCTGCTGGTACTTATAA  
19FTW ATTAGTTTCTGATGCACAAGGTGCTTTGAAATTACAGGCCCTTCTGTCAGGTACATATTA  
9VSP ATTAGTTTCTGATGCACAAGGTGCTTTGAAATTACAGGCCCTTCTGTCAGGTACATATTA  
TIGR4 ATTAGTTTCTGATGCACAAGGTGCTTTGAAATTACAGGCCCTTCTGTCAGGTACATATTA  
23FTW TCTTACTTCTAACACTGATGGTCAATTCCAAATTTTCAGGTCTTGCTGCTGGAAGCTACAC  
\* \* \* \* \*

14CSR ATTAGAAGAAATTAAAGCTCCAGAAGGTTTTGCGAAAAT---TGATGATGTAGAATTTGT  
670 ATTAGAAGAAATTAAAGCTCCAGAAGGTTTTGCGAAAAT---TGATGATGTAGAATTTGT  
6BF ATTAGAAGAAATTAAAGCTCCAGAAGGTTTTGCGAAAAT---TGATGATGTAGAATTTGT  
6BSP ATTAGAAGAAATTAAAGCTCCAGAAGGTTTTGCGAAAAT---TGATGATGTAGAATTTGT  
19AH ATTAGAAGAAATTAAAGCTCCAGAAGGTTTTGCGAAAAT---TGATGATGTAGAATTTGT  
23FPO ATTAGAAGAAATTAAAGCTCCAGAAGGTTTTGCGAAAAT---TGATGATGTAGAATTTGT  
19FTW CTTAGAAGAAACAAAACAGCCTGCTGGTTATGCATTACTAAGTCCGTCAGAAATTTGA  
9VSP CTTAGAAGAAACAAAACAGCCTGCTGGTTATGCATTACTAAGTCCGTCAGAAATTTGA  
TIGR4 CTTAGAAGAAACAAAACAGCCTGCTGGTTATGCATTACTAAGTCCGTCAGAAATTTGA  
23FTW GTTGAAGAAACAAAAGCTCCAGAAGGTTTTGCAAACT---TGGAGATGTGAAGTTGA  
\* \* \* \* \*

14CSR TGTTGGAGCAGGTTCTTG-----GAATCAAGGTGAGTTTAATTACTTAAAAGATGTTCA  
670 TGTTGGAGCAGGTTCTTG-----GAATCAAGGTGAGTTTAATTACTTAAAAGATGTTCA  
6BF TGTTGGAGCAGGTTCTTG-----GAATCAAGGTGAGTTTAATTACTTAAAAGATGTTCA  
6BSP TGTTGGAGCAGGTTCTTG-----GAATCAAGGTGAGTTTAATTACTTAAAAGATGTTCA  
19AH TGTTGGAGCAGGTTCTTG-----GAATCAAGGTGAGTTTAATTACTTAAAAGATGTTCA  
23FPO TGTTGGAGCAGGTTCTTG-----GAATCAAGGTGAGTTTAATTACTTAAAAGATGTTCA  
19FTW AGTCACTGCAACTTCTTATTCAGCGACTGGACAAGGCATTGAGTATACTGCTGGTTCAGG  
9VSP AGTCACTGCAACTTCTTATTCAGCGACTGGACAAGGCATTGAGTATACTGCTGGTTCAGG  
TIGR4 AGTCACTGCAACTTCTTATTCAGCGACTGGACAAGGCATTGAGTATACTGCTGGTTCAGG  
23FTW GGTGGAGCAGGTTCTTG-----GAATCAAGGTGAGTTTAATTACTTAAAAGATGTTCA  
\* \* \* \* \*

14CSR AAAGAATGACGCTACAAAAGTAGTCAACAAAAAAATCACTATCCCACAAACGGGTGGTAT  
670 AAAGAATGACGCTACAAAAGTAGTCAACAAAAAAATCACTATCCCACAAACGGGTGGTAT  
6BF AAAGAATGACGCTACAAAAGTAGTCAACAAAAAAATCACTATCCCACAAACGGGTGGTAT  
6BSP AAAGAATGACGCTACAAAAGTAGTCAACAAAAAAATCACTATCCCACAAACGGGTGGTAT  
19AH AAAGAATGACGCTACAAAAGTAGTCAACAAAAAAATCACTATCCCACAAACGGGTGGTAT  
23FPO AAAGAATGACGCTACAAAAGTAGTCAACAAAAAAATCAGATCCCACAAACGGGTGGTAT  
19FTW TAAAGATGACGCTACAAAAGTAGTCAACAAAAAAATCAGATCCCACAAACGGGTGGTAT  
9VSP TAAAGATGACGCTACAAAAGTAGTCAACAAAAAAATCAGATCCCACAAACGGGTGGTAT  
TIGR4 TAAAGATGACGCTACAAAAGTAGTCAACAAAAAAATCACTATCCCACAAACGGGTGGTAT  
23FTW GAAGAACGACGCTACAAAAGTAGTCAACAAAAAAATCAGATCCCTCAAACGGGTGGTAT  
\* \* \* \* \*

14CSR TGGTACAATTATCTTTGCTGTAGCGGGGGCTGCGATTATGGGTATTGCAGTGTACGCATA  
670 TGGTACAATTATCTTTGCTGTAGCGGGGGCTGCGATTATGGGTATTGCAGTGTACGCATA  
6BF TGGTACAATTATCTTTGCTGTAGCGGGGGCTGCGATTATGGGTATTGCAGTGTACGCATA  
6BSP TGGTACAATTATCTTTGCTGTAGCGGGGGCTGCGATTATGGGTATTGCAGTGTACGCATA  
19AH TGGTACAATTATCTTTGCTGTAGCGGGGGCTGCGATTATGGGTATTGCAGTGTACGCATA  
23FPO TGGTACAATTATCTTTGCTGTAGCAGGGGGCTGTGATTATGGGTATTGCAGTGTACGCATA  
19FTW TGGTACAATTATCTTTGCTGTAGCAGGGGGCTGTGATTATGGGTATTGCAGTGTACGCATA  
9VSP TGGTACAATTATCTTTGCTGTAGCAGGGGGCTGTGATTATGGGTATTGCAGTGTACGCATA  
TIGR4 TGGTACAATTATCTTTGCTGTAGCGGGGGCTGCGATTATGGGTATTGCAGTGTACGCATA  
23FTW TGGTACAATTATCTTTGCTGTAGCGGGGGCTGTGATTATGGGTATTGCAGTGTACGCATA  
\*\*\*\*\*

Figure 196X

PCT/US05/27239 417/487

14CSR TGTTAAAAACAACAAAGATGAGGATCAACTTGCTTAAGTAAGAGAGAAAAGGAGCCATTGA  
670 TGTTAAAAACAACAAAGATGAGGATCAACTTGCTTAAGTAAGAGAGAAAAGGAGCCATTGA  
6BF TGTTAAAAACAACAAAGATGAGGATCAACTTGCTTAAGTAAGAGAGAAAAGGAGCCATTGA  
6BSP TGTTAAAAACAACAAAGATGAGGATCAACTTGCTTAAGTAAGAGAGAAAAGGAGCCATTGA  
19AH TGTTAAAAACAACAAAGATGAGGATCAACTTGCTTAAGTAAGAGAGAAAAGGAGCCATTGA  
23FPO TGTTAAAAACAACAAAGATGAGGATCAACTTGCTTAAGTAAGAGAGAAAAGGAGCCATTGA  
19FTW TGTTAAAAACAACAAAGATGAGGATCAACTTGCTTAAGTAAGAGAGAAAAGGAGCCATTGA  
9VSP TGTTAAAAACAACAAAGATGAGGATCAACTTGCTTAAGTAAGAGAGAAAAGGAGCCATTGA  
TIGR4 TGTTAAAAACAACAAAGATGAGGATCAACTTGCTTAAGTAAGAGAGAAAAGGAGCCATTGA  
23FTW TGTTAAAAACAACAAAGATGAGGATCAACTTGCTTAAGTAAGAGAGAAAAGGAGCCATTGA  
\*\*\*\*\*

14CSR TGACAATGCAGAAAATGCAGAAAATG-----  
670 TGACAATGCAGAAAATGCAGAAAATG-----  
6BF TGACAATGCAGAAAATGCAGAAAATG-----  
6BSP TGACAATGCAGAAAATGCAGAAAATG-----  
19AH TGACAATGCAGAAAATGCAGAAAATG-----  
23FPO TGACAATGCAGAAAATGCAGAAAATG-----  
19FTW TGACAATGCAGAAAATGCAGAAAATG-----  
9VSP TGACAATGCAGAAAATGCAGAAAATGCAGAAAATGCAGAAAATGCAGAAAATGCAGAAAA  
TIGR4 TGACAATGCAGAAAATGCAGAAAATG-----  
23FTW TGACAATGCAGAAAATGCAGAAAATG-----  
\*\*\*\*\*

14CSR --ATTAGTCGTATCTTCTTTGTTATGGCTCTGTGTTTTCTCTTGATGGGGTGCACATG  
670 --ATTAGTCGTATCTTCTTTGTTATGGCTCTGTGTTTTCTCTTGATGGGGTGCACATG  
6BF --ATTAGTCGTATCTTCTTTGTTATGGCTCTGTGTTTTCTCTTGATGGGGTGCACATG  
6BSP --ATTAGTCGTATCTTCTTTGTTATGGCTCTGTGTTTTCTCTTGATGGGGTGCACATG  
19AH --ATTAGTCGTATCTTCTTTGTTATGGCTCTGTGTTTTCTCTTGATGGGGTGCACATG  
23FPO --ATTAGTCGTATCTTCTTTGTTATGGCTCTGTGTTTTCTCTTGATGGGGTGCACATG  
19FTW --ATTAGTCGTATCTTCTTTGTTATGGCTCTGTGTTTTCTCTTGATGGGGTGCACATG  
9VSP TGATTAGTCGTATCTTCTTTGTTATGGCTCTGTGTTTTCTCTTGATGGGGTGCACATG  
TIGR4 --ATTAGTCGTATCTTCTTTGTTATGGCTCTGTGTTTTCTCTTGATGGGGTGCACATG  
23FTW --ATTAGTCGTATCTTCTTTGTTATGGCTCTGTGTTTTCTCTTGATGGGGTGCACATG  
\*\*\*\*\*

14CSR CAGTCCAAGCGCAAGAAGATCACACGTTGGTCTTGCAATTGGAGAACATATCAGGAGGTGG  
670 CAGTCCAAGCGCAAGAAGATCACACGTTGGTCTTGCAATTGGAGAACATATCAGGAGGTGG  
6BF CAGTCCAAGCGCAAGAAGATCACACGTTGGTCTTGCAATTGGAGAACATATCAGGAGGTGG  
6BSP CAGTCCAAGCGCAAGAAGATCACACGTTGGTCTTGCAATTGGAGAACATATCAGGAGGTGG  
19AH CAGTCCAAGCGCAAGAAGATCACACGTTGGTCTTGCAATTGGAGAACATATCAGGAGGTGG  
23FPO CAGTCCAAGCGCAAGAAGATCACACGTTGGTCTTGCAATTGGAGAACATATCAGGAGGTGG  
19FTW CAGTCCAAGCGCAAGAAGATCACACGTTGGTCTTGCAATTGGAGAACATATCAGGAGGTGG  
9VSP CAGTCCAAGCGCAAGAAGATCACACGTTGGTCTTGCAATTGGAGAACATATCAGGAGGTGG  
TIGR4 CAGTCCAAGCGCAAGAAGATCACACGTTGGTCTTGCAATTGGAGAACATATCAGGAGGTGG  
23FTW CAGTCCAAGCGCAAGAAGATCACACGTTGGTCTTGCAATTGGAGAACATATCAGGAGGTGG  
\*\*\*\*\*

14CSR TTAGTCAATTGCCATCTCGTGATGGTCATCGGTTGCAAGTATGGAAGTTGGATGATTCGT  
670 TTAGTCAATTGCCATCTCGTGATGGTCATCGGTTGCAAGTATGGAAGTTGGATGATTCGT  
6BF TTAGTCAATTGCCATCTCGTGATGGTCATCGGTTGCAAGTATGGAAGTTGGATGATTCGT  
6BSP TTAGTCAATTGCCATCTCGTGATGGTCATCGGTTGCAAGTATGGAAGTTGGATGATTCGT  
19AH TTAGTCAATTGCCATCTCGTGATGGTCATCGGTTGCAAGTATGGAAGTTGGATGATTCGT  
23FPO TTAGTCAATTGCCATCTCGTGATGGTCATCGGTTGCAAGTATGGAAGTTGGATGATTCGT  
19FTW TTAGTCAATTGCCATCTCGTGATGGTCATCGGTTGCAAGTATGGAAGTTGGATGATTCGT  
9VSP TTAGTCAATTGCCATCTCGTGATGGTCATCGGTTGCAAGTATGGAAGTTGGATGATTCGT  
TIGR4 TTAGTCAATTGCCATCTCGTGATGGTCATCGGTTGCAAGTATGGAAGTTGGATGATTCGT  
23FTW TTAGTCAATTGCCATCTCGTGATGGTCATCGGTTGCAAGTATGGAAGTTGGATGATTCGT  
\*\*\*\*\*

Figure 196Y

14CSR ATTCCCTATGATGATCGGGTGCAAATTGTAAGAGACTTGCATTCTGTTGGGATGAGAATAAAC  
670 ATTCCCTATGATGATCGGGTGCAAATTGTAAGAGACTTGCATTCTGTTGGGATGAGAATAAAC  
6BF ATTCCCTATGATGATCGGGTGCAAATTGTAAGAGACTTGCATTCTGTTGGGATGAGAATAAAC  
6BSP ATTCCCTATGATGATCGGGTGCAAATTGTAAGAGACTTGCATTCTGTTGGGATGAGAATAAAC  
19AH ATTCCCTATGATGATCGGGTGCAAATTGTAAGAGACTTGCATTCTGTTGGGATGAGAATAAAC  
23FPO ATTCCCTATGATAATCGGGTGCAAATTGTGAGAGACTTGCATTCTGTTGGGATGAGAATAAAC  
19FTW ATTCCCTATGATAATCGGGTGCAAATTGTGAGAGACTTGCATTCTGTTGGGATGAGAATAAAC  
9VSP ATTCCCTATGATAATCGGGTGCAAATTGTGAGAGACTTGCATTCTGTTGGGATGAGAATAAAC  
TIGR4 ATTCCCTATGATGATCGGGTGCAAATTGTAAGAGACTTGCATTCTGTTGGGATGAGAATAAAC  
23FTW ATTCCCTATGATAATCGGGTGCAAATTGTGAGAGACTTGCATTCTGTTGGGATGAGAATAAAC  
\*\*\*\*\*

14CSR TTTCTTCTTTCAAAAAGACTTCGTTTGAGATGACCTTCCTTGAGAATCAGATTGAAGTAT  
670 TTTCTTCTTTCAAAAAGACTTCGTTTGAGATGACCTTCCTTGAGAATCAGATTGAAGTAT  
6BF TTTCTTCTTTCAAAAAGACTTCGTTTGAGATGACCTTCCTTGAGAATCAGATTGAAGTAT  
6BSP TTTCTTCTTTCAAAAAGACTTCGTTTGAGATGACCTTCCTTGAGAATCAGATTGAAGTAT  
19AH TTTCTTCTTTCAAAAAGACTTCGTTTGAGATGACCTTCCTTGAGAATCAGATTGAAGTAT  
23FPO TTTCTTCTTTCAAAAAGACTTCGTTTGAGATGACCTTCCTTGAGAATCAGATTGAAGTAT  
19FTW TTTCTTCTTTCAAAAAGACTTCGTTTGAGATGACCTTCCTTGAGAATCAGATTGAAGTAT  
9VSP TTTCTTCTTTCAAAAAGACTTCGTTTGAGATGACCTTCCTTGAGAATCAGATTGAAGTAT  
TIGR4 TTTCTTCTTTCAAAAAGACTTCGTTTGAGATGACCTTCCTTGAGAATCAGATTGAAGTAT  
23FTW TTTCTTCTTTCAAAAAGACTTCGTTTGAGATGACCTTCCTTGAGAATCAGATTGAAGTAT  
\*\*\*\*\*

14CSR CTCATATTCCAAATGGTCTTTACTATGTTGCTCTATTATCCAGACGGATGCGGTTTCTT  
670 CTCATATTCCAAATGGTCTTTACTATGTTGCTCTATTATCCAGACGGATGCGGTTTCTT  
6BF CTCATATTCCAAATGGTCTTTACTATGTTGCTCTATTATCCAGACGGATGCGGTTTCTT  
6BSP CTCATATTCCAAATGGTCTTTACTATGTTGCTCTATTATCCAGACGGATGCGGTTTCTT  
19AH CTCATATTCCAAATGGTCTTTACTATGTTGCTCTATTATCCAGACGGATGCGGTTTCTT  
23FPO CTCATATTCCAAATGGTCTTTACTATGTTGCTCTATTATCCAGACGGATGCGGTTTCTT  
19FTW CTCATATTCCAAATGGTCTTTACTATGTTGCTCTATTATCCAGACGGATGCGGTTTCTT  
9VSP CTCATATTCCAAATGGTCTTTACTATGTTGCTCTATTATCCAGACGGATGCGGTTTCTT  
TIGR4 CTCATATTCCAAATGGTCTTTACTATGTTGCTCTATTATCCAGACGGATGCGGTTTCTT  
23FTW CTCATATTCCAAATGGTCTTTACTATGTTGCTCTATTATCCAGACGGATGCGGTTTCTT  
\*\*\*\*\*

14CSR ATCCAGCTGAATTTCTTTTTGAAATGACAGATCAAACGGTAGAGCCTTTGGTCATTGTAG  
670 ATCCAGCTGAATTTCTTTTTGAAATGACAGATCAAACGGTAGAGCCTTTGGTCATTGTAG  
6BF ATCCAGCTGAATTTCTTTTTGAAATGACAGATCAAACGGTAGAGCCTTTGGTCATTGTAG  
6BSP ATCCAGCTGAATTTCTTTTTGAAATGACAGATCAAACGGTAGAGCCTTTGGTCATTGTAG  
19AH ATCCAGCTGAATTTCTTTTTGAAATGACAGATCAAACGGTAGAGCCTTTGGTCATTGTAG  
23FPO ATCCAGCTGAATTTCTTTTTGAAATGACAGATCAAACGGTAGAGCCTTTGGTCATTGTAG  
19FTW ATCCAGCTGAATTTCTTTTTGAAATGACAGATCAAACGGTAGAGCCTTTGGTCATTGTAG  
9VSP ATCCAGCTGAATTTCTTTTTGAAATGACAGATCAAACGGTAGAGCCTTTGGTCATTGTAG  
TIGR4 ATCCAGCTGAATTTCTTTTTGAAATGACAGATCAAACGGTAGAGCCTTTGGTCATTGTAG  
23FTW ATCCAGCTGAATTTCTTTTTGAAATGACAGATCAAACGGTAGAGCCTTTGGTCATTGTAG  
\*\*\*\*\*

14CSR CGAAAAAACAGATACAATGACAACAAAGGTGAAGCTGATAAAGGTGGATCAAGACCACA  
670 CGAAAAAACAGATACAATGACAACAAAGGTGAAGCTGATAAAGGTGGATCAAGACCACA  
6BF CGAAAAAACAGATACAATGACAACAAAGGTGAAGCTGATAAAGGTGGATCAAGACCACA  
6BSP CGAAAAAACAGATACAATGACAACAAAGGTGAAGCTGATAAAGGTGGATCAAGACCACA  
19AH CGAAAAAACAGATACAATGACAACAAAGGTGAAGCTGATAAAGGTGGATCAAGACCACA  
23FPO CGAAAAAACAGATACGGTGACAACAAAGGTGAAGCTGATAAAGGTGGATCAAGACCACA  
19FTW CGAAAAAACAGATACGGTGACAACAAAGGTGAAGCTGATAAAGGTGGATCAAGACCACA  
9VSP CGAAAAAACAGATACGGTGACAACAAAGGTGAAGCTGATAAAGGTGGATCAAGACCACA  
TIGR4 CGAAAAAACAGATACAATGACAACAAAGGTGAAGCTGATAAAGGTGGATCAAGACCACA  
23FTW CGAAAAAACAGATACGGTGACAACAAAGGTGAAGCTGATAAAGGTGGATCAAGACCACA  
\*\*\*\*\*

Figure 196X

14CSR ATCGCTTGGAGGGTGTCTGGCTTTAAATTGGTATCAGTAGCAAGAGATGGTTCTGAAAAAG  
670 ATCGCTTGGAGGGTGTCTGGCTTTAAATTGGTATCAGTAGCAAGAGATGGTTCTGAAAAAG  
6BF ATCGCTTGGAGGGTGTCTGGCTTTAAATTGGTATCAGTAGCAAGAGATGGTTCTGAAAAAG  
6BSP ATCGCTTGGAGGGTGTCTGGCTTTAAATTGGTATCAGTAGCAAGAGATGGTTCTGAAAAAG  
19AH ATCGCTTGGAGGGTGTCTGGCTTTAAATTGGTATCAGTAGCAAGAGATGGTTCTGAAAAAG  
23FPO ATCGCTTGGAGGGTGTCTGGCTTTAAATTGGTATCAGTAGCAAGAGATGGTTCTGAAAAAG  
19FTW ATCGCTTGGAGGGTGTCTGGCTTTAAATTGGTATCAGTAGCAAGAGATGGTTCTGAAAAAG  
9VSP ATCGCTTGGAGGGTGTCTGGCTTTAAATTGGTATCAGTAGCAAGAGATGGTTCTGAAAAAG  
TIGR4 ATCGCTTGGAGGGTGTCTGGCTTTAAATTGGTATCAGTAGCAAGAGATGGTTCTGAAAAAG  
23FTW ATCGCTTGGAGGGTGTCTGGCTTTAAATTGGTATCAGTAGCAAGAGATGGTTCTGAAAAAG  
\*\*\*\*\*

14CSR AGGTTCCCTTGATTGGAGAATACCGTTACAGTTCCTCTGGTCAAGTAGGGAGAACTCTCT  
670 AGGTTCCCTTGATTGGAGAATACCGTTACAGTTCCTCTGGTCAAGTAGGGAGAACTCTCT  
6BF AGGTTCCCTTGATTGGAGAATACCGTTACAGTTCCTCTGGTCAAGTAGGGAGAACTCTCT  
6BSP AGGTTCCCTTGATTGGAGAATACCGTTACAGTTCCTCTGGTCAAGTAGGGAGAACTCTCT  
19AH AGGTTCCCTTGATTGGAGAATACCGTTACAGTTCCTCTGGTCAAGTAGGGAGAACTCTCT  
23FPO AGGTTCCCTTGATTGGAGAATACCGTTACAGTTCCTCTGGTCAAGTAGGGAGAACTCTCT  
19FTW AGGTTCCCTTGATTGGAGAATACCGTTACAGTTCCTCTGGTCAAGTAGGGAGAACTCTCT  
9VSP AGGTTCCCTTGATTGGAGAATACCGTTACAGTTCCTCTGGTCAAGTAGGGAGAACTCTCT  
TIGR4 AGGTTCCCTTGATTGGAGAATACCGTTACAGTTCCTCTGGTCAAGTAGGGAGAACTCTCT  
23FTW AGGTTCCCTTGATTGGAGAATACCGTTACAGTTCCTCTGGTCAAGTAGGGAGAACTCTCT  
\*\*\*\*\*

14CSR ATACTGATAAAAAATGGAGAGATTTTGTGACAAATCTTCCTCTTGGGAACTATCGTTTCA  
670 ATACTGATAAAAAATGGAGAGATTTTGTGACAAATCTTCCTCTTGGGAACTATCGTTTCA  
6BF ATACTGATAAAAAATGGAGAGATTTTGTGACAAATCTTCCTCTTGGGAACTATCGTTTCA  
6BSP ATACTGATAAAAAATGGAGAGATTTTGTGACAAATCTTCCTCTTGGGAACTATCGTTTCA  
19AH ATACTGATAAAAAATGGAGAGATTTTGTGACAAATCTTCCTCTTGGGAACTATCGTTTCA  
23FPO ATACTGATAAAAAATGGAGAGATTTTGTGACAAATCTTCCTCTTGGGAACTATCGTTTCA  
19FTW ATACTGATAAAAAATGGAGAGATTTTGTGACAAATCTTCCTCTTGGGAACTATCGTTTCA  
9VSP ATACTGATAAAAAATGGAGAGATTTTGTGACAAATCTTCCTCTTGGGAACTATCGTTTCA  
TIGR4 ATACTGATAAAAAATGGAGAGATTTTGTGACAAATCTTCCTCTTGGGAACTATCGTTTCA  
23FTW ATACTGATAAAAAATGGAGAGATTTTGTGACAAATCTTCCTCTTGGGAACTATCGTTTCA  
\*\*\*\*\*

14CSR AGGAGGTGGAGCCACTGGCAGGCTATGCTGTTACGACGCTGGATACGGATGTCCAGCTGG  
670 AGGAGGTGGAGCCACTGGCAGGCTATGCTGTTACGACGCTGGATACGGATGTCCAGCTGG  
6BF AGGAGGTGGAGCCACTGGCAGGCTATGCTGTTACGACGCTGGATACGGATGTCCAGCTGG  
6BSP AGGAGGTGGAGCCACTGGCAGGCTATGCTGTTACGACGCTGGATACGGATGTCCAGCTGG  
19AH AGGAGGTGGAGCCACTGGCAGGCTATGCTGTTACGACGCTGGATACGGATGTCCAGCTGG  
23FPO AGGAGGTGGAGCCACTGGCAGGCTATGCTGTTACGACGCTGGATACGGATGTCCAGTTGG  
19FTW AGGAGGTGGAGCCACTGGCAGGCTATGCTGTTACGACGCTGGATACGGATGTCCAGTTGG  
9VSP AGGAGGTGGAGCCACTGGCAGGCTATGCTGTTACGACGCTGGATACGGATGTCCAGTTGG  
TIGR4 AGGAGGTGGAGCCACTGGCAGGCTATGCTGTTACGACGCTGGATACGGATGTCCAGTTGG  
23FTW AGGAGGTGGAGCCACTGGCAGGCTATGCTGTTACGACGCTGGATACGGATGTCCAGTTGG  
\*\*\*\*\*

14CSR TAGATCATCAGCTGGTGACGATTACGGTTGTCAATCAGAAATTACCACGTGGCAATGTTG  
670 TAGATCATCAGCTGGTGACGATTACGGTTGTCAATCAGAAATTACCACGTGGCAATGTTG  
6BF TAGATCATCAGCTGGTGACGATTACGGTTGTCAATCAGAAATTACCACGTGGCAATGTTG  
6BSP TAGATCATCAGCTGGTGACGATTACGGTTGTCAATCAGAAATTACCACGTGGCAATGTTG  
19AH TAGATCATCAGCTGGTGACGATTACGGTTGTCAATCAGAAATTACCACGTGGCAATGTTG  
23FPO TAGATCATCAGCTGGTGACGATTACGGTTGTCAATCAGAAATTACCACGTGGCAATGTTG  
19FTW TAGATCATCAGCTGGTGACGATTACGGTTGTCAATCAGAAATTACCACGTGGCAATGTTG  
9VSP TAGATCATCAGCTGGTGACGATTACGGTTGTCAATCAGAAATTACCACGTGGCAATGTTG  
TIGR4 TAGATCATCAGCTGGTGACGATTACGGTTGTCAATCAGAAATTACCACGTGGCAATGTTG  
23FTW TAGATCATCAGCTGGTGACGATTACGGTTGTCAATCAGAAATTACCACGTGGCAATGTTG  
\*\*\*\*\*

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14CSR ACTTTATGAAGGTGGATGGTCGGACCAATACCTCTCTTCAAGGGGCAATGTTCAAAGTCA  
670 ACTTTATGAAGGTGGATGGTCGGACCAATACCTCTCTTCAAGGGGCAATGTTCAAAGTCA  
6BF ACTTTATGAAGGTGGATGGTCGGACCAATACCTCTCTTCAAGGGGCAATGTTCAAAGTCA  
6BSP ACTTTATGAAGGTGGATGGTCGGACCAATACCTCTCTTCAAGGGGCAATGTTCAAAGTCA  
19AH ACTTTATGAAGGTGGATGGTCGGACCAATACCTCTCTTCAAGGGGCAATGTTCAAAGTCA  
23FPO ACTTTATGAAGGTGGATGGTAGGACCAATACCTCTCTTCAAGGGGCAATGTTCAAAGTCA  
19FTW ACTTTATGAAGGTGGATGGTAGGACCAATACCTCTCTTCAAGGGGCAATGTTCAAAGTCA  
9VSP ACTTTATGAAGGTGGATGGTAGGACCAATACCTCTCTTCAAGGGGCAATGTTCAAAGTCA  
TIGR4 ACTTTATGAAGGTGGATGGTCGGACCAATACCTCTCTTCAAGGGGCAATGTTCAAAGTCA  
23FTW ACTTTATGAAGGTGGATGGTCGGACCAATACCTCTCTTCAAGGGGCAATGTTCAAAGTCA  
\*\*\*\*\*

14CSR TGAAAGAAGAAAGCGGACACTATACTCCTGTTCTTCAAAATGGTAAGGAAGTAGTTGTAA  
670 TGAAAGAAGAAAGCGGACACTATACTCCTGTTCTTCAAAATGGTAAGGAAGTAGTTGTAA  
6BF TGAAAGAAGAAAGCGGACACTATACTCCTGTTCTTCAAAATGGTAAGGAAGTAGTTGTAA  
6BSP TGAAAGAAGAAAGCGGACACTATACTCCTGTTCTTCAAAATGGTAAGGAAGTAGTTGTAA  
19AH TGAAAGAAGAAAGCGGACACTATACTCCTGTTCTTCAAAATGGTAAGGAAGTAGTTGTAA  
23FPO TGAAAGAAGAAACGGGACACTATACTCCTGTTCTTCAAAATGGTAAGGAAGTAGTTGTGG  
19FTW TGAAAGAAGAAACGGGACACTATACTCCTGTTCTTCAAAATGGTAAGGAAGTAGTTGTGG  
9VSP TGAAAGAAGAAACGGGACACTATACTCCTGTTCTTCAAAATGGTAAGGAAGTAGTTGTGG  
TIGR4 TGAAAGAAGAAAGCGGACACTATACTCCTGTTCTTCAAAATGGTAAGGAAGTAGTTGTAA  
23FTW TGAAAGAAGAAACGGGACACTATACTCCTGTTCTTCAAAATGGTAAGGAAGTAGTTGTGG  
\*\*\*\*\*

14CSR CATCAGGGAAAGATGGTCGTTTCCGAGTGGAAGGTCTAGAGTATGGGACATACTATTTAT  
670 CATCAGGGAAAGATGGTCGTTTCCGAGTGGAAGGTCTAGAGTATGGGACATACTATTTAT  
6BF CATCAGGGAAAGATGGTCGTTTCCGAGTGGAAGGTCTAGAGTATGGGACATACTATTTAT  
6BSP CATCAGGGAAAGATGGTCGTTTCCGAGTGGAAGGTCTAGAGTATGGGACATACTATTTAT  
19AH CATCAGGGAAAGATGGTCGTTTCCGAGTGGAAGGTCTAGAGTATGGGACATACTATTTAT  
23FPO CATCAGGGAAAGATGGTCGTTTCCGAGTGGAAGGTCTAGAGTATGGGACATACTATTTAT  
19FTW CATCAGGGAAAGATGGTCGTTTCCGAGTGGAAGGTCTAGAGTATGGGACATACTATTTAT  
9VSP CATCAGGGAAAGATGGTCGTTTCCGAGTGGAAGGTCTAGAGTATGGGACATACTATTTAT  
TIGR4 CATCAGGGAAAGATGGTCGTTTCCGAGTGGAAGGTCTAGAGTATGGGACATACTATTTAT  
23FTW CATCAGGGAAAGATGGTCGTTTCCGAGTGGAAGGTCTAGAGTATGGGACATACTATTTAT  
\*\*\*\*\*

14CSR GGGAGCTCCAAGCTCCAAGTGGTTATGTTCAATTAACATCGCCTGTTTCCTTTACAATCG  
670 GGGAGCTCCAAGCTCCAAGTGGTTATGTTCAATTAACATCGCCTGTTTCCTTTACAATCG  
6BF GGGAGCTCCAAGCTCCAAGTGGTTATGTTCAATTAACATCGCCTGTTTCCTTTACAATCG  
6BSP GGGAGCTCCAAGCTCCAAGTGGTTATGTTCAATTAACATCGCCTGTTTCCTTTACAATCG  
19AH GGGAGCTCCAAGCTCCAAGTGGTTATGTTCAATTAACATCGCCTGTTTCCTTTACAATCG  
23FPO GGGAGCTCCAAGCTCCAAGTGGTTATGTTCAATTAACATCGCCTGTTTCCTTTACAATCG  
19FTW GGGAGCTCCAAGCTCCAAGTGGTTATGTTCAATTAACATCGCCTGTTTCCTTTACAATCG  
9VSP GGGAGCTCCAAGCTCCAAGTGGTTATGTTCAATTAACATCGCCTGTTTCCTTTACAATCG  
TIGR4 GGGAGCTCCAAGCTCCAAGTGGTTATGTTCAATTAACATCGCCTGTTTCCTTTACAATCG  
23FTW GGGAGCTCCAAGCTCCAAGTGGTTATGTTCAATTAACATCGCCTGTTTCCTTTACAATCG  
\*\*\*\*\*

14CSR GGAAAGATACTCGTAAGGAACTGGTAACAGTGGTTAAAAATAACAAGCGACCACGGATTG  
670 GGAAAGATACTCGTAAGGAACTGGTAACAGTGGTTAAAAATAACAAGCGACCACGGATTG  
6BF GGAAAGATACTCGTAAGGAACTGGTAACAGTGGTTAAAAATAACAAGCGACCACGGATTG  
6BSP GGAAAGATACTCGTAAGGAACTGGTAACAGTGGTTAAAAATAACAAGCGACCACGGATTG  
19AH GGAAAGATACTCGTAAGGAACTGGTAACAGTGGTTAAAAATAACAAGCGACCACGGATTG  
23FPO GGAAAGATACTCGTAAGGAACTGGTAACAGTGGTTAAAAATAACAAGCGACCACGGATTG  
19FTW GGAAAGATACTCGTAAGGAACTGGTAACAGTGGTTAAAAATAACAAGCGACCACGGATTG  
9VSP GGAAAGATACTCGTAAGGAACTGGTAACAGTGGTTAAAAATAACAAGCGACCACGGATTG  
TIGR4 GGAAAGATACTCGTAAGGAACTGGTAACAGTGGTTAAAAATAACAAGCGACCACGGATTG  
23FTW GGAAAGATACTCGTAAGGAACTGGTAACAGTGGTTAAAAATAACAAGCGACCACGGATTG  
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Figure 196AB



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14CSR ATGTGCCAGATACAGGGGAAGAAACCTTGTATATCTTGATGCTTGTGCCATTTTGTGTTGT  
670 ATGTGCCAGATACAGGGGAAGAAACCTTGTATATCTTGATGCTTGTGCCATTTTGTGTTGT  
6BF ATGTGCCAGATACAGGGGAAGAAACCTTGTATATCTTGATGCTTGTGCCATTTTGTGTTGT  
6BSP ATGTGCCAGATACAGGGGAAGAAACCTTGTATATCTTGATGCTTGTGCCATTTTGTGTTGT  
19AH ATGTGCCAGATACAGGGGAAGAAACCTTGTATATCTTGATGCTTGTGCCATTTTGTGTTGT  
23FPO ATGTGCCAGATACAGGGGAAGAAACCTTGTATATCTTGATGCTTGTGCCATTTTGTGTTGT  
19FTW ATGTGCCAGATACAGGGGAAGAAACCTTGTATATCTTGATGCTTGTGCCATTTTGTGTTGT  
9VSP ATGTGCCAGATACAGGGGAAGAAACCTTGTATATCTTGATGCTTGTGCCATTTTGTGTTGT  
TIGR4 ATGTGCCAGATACAGGGGAAGAAACCTTGTATATCTTGATGCTTGTGCCATTTTGTGTTGT  
23FTW ATGTGCCAGATACAGGGGAAGAAACCTTGTATATCTTGATGCTTGTGCCATTTTGTGTTGT  
\*\*\*\*\*

14CSR TTGGTAGTGGTTATTATCTTACGAAAAAACCAATAACTGATATTCAATGTACATCATTA  
670 TTGGTAGTGGTTATTATCTTACGAAAAAACCAATAACTGATATTCAATGTACATCATTA  
6BF TTGGTAGTGGTTATTATCTTACGAAAAAACCAATAACTGATATTCAATGTACATCATTA  
6BSP TTGGTAGTGGTTATTATCTTACGAAAAAACCAATAACTGATATTCAATGTACATCATTA  
19AH TTGGTAGTGGTTATTATCTTACGAAAAAACCAATAACTGATATTCAATGTACATCATTA  
23FPO TTGGTAGTGGCTATTATCTTACGAAAAAACCAATAACTGATATTCAATGTACATCATTA  
19FTW TTGGTAGTGGCTATTATCTTACGAAAAAACCAATAACTGATATTCAATGTACATCATTA  
9VSP TTGGTAGTGGCTATTATCTTACGAAAAAACCAATAACTGATATTCAATGTACATCATTA  
TIGR4 TTGGTAGTGGCTATTATCTTACGAAAAAACCAATAACTGATATTCAATGTACATCATTA  
23FTW TTGGTAGTGGCTATTATCTTACGAAAAAACCAATAACTGATATTCAATGTACATCATTA  
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14CSR TGAAAAAGATAGCAGGCTGAAGGGAAGACCAGAGTACTCTGAGGTGATGTTAATCAGGAA  
670 TGAAAAAGATAGCAGGCTGAAGGGAAGACCAGAGTACTCTGAGGTGATGTTAATCAGGAA  
6BF TGAAAAAGATAGCAGGCTGAAGGGAAGACCAGAGTACTCTGAGGTGATGTTAATCAGGAA  
6BSP TGAAAAAGATAGCAGGCTGAAGGGAAGACCAGAGTACTCTGAGGTGATGTTAATCAGGAA  
19AH TGAAAAAGATAGCAGGCTGAAGGGAAGACCAGAGTACTCTGAGGTGATGTTAATCAGGAA  
23FPO TGAAAAAGATAGCAGGCTGAAGGGAAGACCAGAGTACTCTGAGGTGATGTTAATCAGGAA  
19FTW TGAAAAAGATAGCAGGCTGAAGGGAAGACCAGAGTACTCTGAGGTGATGTTAATCAGGAA  
9VSP TGAAAAAGATAGCAGGCTGAAGGGAAGACCAGAGTACTCTGAGGTGATGTTAATCAGGAA  
TIGR4 TGAAAAAGATAGCAGGCTGAAGGGAAGACCAGAGTACTCTGAGGTGATGTTAATCAGGAA  
23FTW TGAAAAAGATAGCAGGCTGAAGGGAAGACCAGAGTACTCTGAGGTGATGTTAATCAGGAA  
\*\*\*\*\*

14CSR TCATGGTGATGTGGCATGAATCACAATAACGGATATGAGGCTGGGCAGATTGTGCCAGCC  
670 TCATGGTGATGTGGCATGAATCACAATAACGGATATGAGGCTGGGCAGATTGTGCCAGCC  
6BF TCATGGTGATGTGGCATGAATCACAATAACGGATATGAGGCTGGGCAGATTGTGCCAGCC  
6BSP TCATGGTGATGTGGCATGAATCACAATAACGGATATGAGGCTGGGCAGATTGTGCCAGCC  
19AH TCATGGTGATGTGGCATGAATCACAATAACGGATATGAGGCTGGGCAGATTGTGCCAGCC  
23FPO TCATGGTGATTGTGGCATGAATCATAATAACGGATATGAGGCTGGGCAGATTGTGCCAGCC  
19FTW TCATGGTGATTGTGGCATGAATCATAATAACGGATATGAGGCTGGGCAGATTGTGCCAGCC  
9VSP TCATGGTGATTGTGGCATGAATCATAATAACGGATATGAGGCTGGGCAGATTGTGCCAGCC  
TIGR4 TCATGGTGATGTGGCATGAATCACAATAACGGATATGAGGCTGGGCAGATTGTGCCAGCC  
23FTW TCATGGTGATTGTGGCATGAATCACAATAACGGATATGAGGCTGGGCAGATTGTGCCAGCC  
\*\*\*\*\*

14CSR TCATTGTGGGTTATTGTTTGTAAAACGATAGGACTGGTCTGGTAATCATTTTAGGAATGG  
670 TCATTGTGGGTTATTGTTTGTAAAACGATAGGACTGGTCTGGTAATCATTTTAGGAATGG  
6BF TCATTGTGGGTTATTGTTTGTAAAACGATAGGACTGGTCTGGTAATCATTTTAGGAATGG  
6BSP TCATTGTGGGTTATTGTTTGTAAAACGATAGGACTGGTCTGGTAATCATTTTAGGAATGG  
19AH TCATTGTGGGTTATTGTTTGTAAAACGATAGGACTGGTCTGGTAATCATTTTAGGAATGG  
23FPO TCATTGTGGGTTATTGTTTGTAAAACGATAGGACTGGTCTGGTAATCATTTTAGGAATGG  
19FTW TCATTGTGGGTTATTGTTTGTAAAACGATAGGACTGGTCTGGTAATCATTTTAGGAATGG  
9VSP TCATTGTGGGTTATTGTTTGTAAAACGATAGGACTGGTCTGGTAATCATTTTAGGAATGG  
TIGR4 TCATTGTGGGTTATTGTTTGTAAAACGATAGGACTGGTCTGGTAATCATTTTAGGAATGG  
23FTW TCATTGTGGGTTATTGTTTGTAAAACGATAGGACTGGTCTGGTAATCATTTTAGGAATGG  
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Figure 196AC

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14CSR ACAGGACTGGGATTCTGATTTAAATGGATGGTGAATCAGAAAGAAATGAGATTTTCTCG  
670 ACAGGACTGGGATTCTGATTTAAATGGATGGTGAATCAGAAAGAAATGAGATTTTCTCG  
6BF ACAGGACTGGGATTCTGATTTAAATGGATGGTGAATCAGAAAGAAATGAGATTTTCTCG  
6BSP ACAGGACTGGGATTCTGATTTAAATGGATGGTGAATCAGAAAGAAATGAGATTTTCTCG  
19AH ACAGGACTGGGATTCTGATTTAAATGGATGGTGAATCAGAAAGAAATGAGATTTTCTCG  
23FPO ACAGGACTGGGATTCTGATTTAAATGGATGGTGAATCAGAAAGAAATGAGATTTTCTCG  
19FTW ACAGGACTGGGATTCTGATTTAAATGGATGGTGAATCAGAAAGAAATGAGATTTTCTCG  
9VSP ACAGGACTGGGATTCTGATTTAAATGGATGGTGAATCAGAAAGAAATGAGATTTTCTCG  
TIGR4 ACAGGACTGGGATTCTGATTTAAATGGATGGTGAATCAGAAAGAAATGAGATTTTCTCG  
23FTW ACAGGACTGGGATTCTGATTTAAATGGATGGTGAATCAGAAAGAAATGAGATTTTCTCG  
\*\*\*\*\*

14CSR TTTCTCTTAGCAGATAGGATTGCTGTTAGGAAAAGCGATAAAATGATGAGTTTGAAGAT  
670 TTTCTCTTAGCAGATAGGATTGCTGTTAGGAAAAGCGATAAAATGATGAGTTTGAAGAT  
6BF TTTCTCTTAGCAGATAGGATTGCTGTTAGGAAAAGCGATAAAATGATGAGTTTGAAGAT  
6BSP TTTCTCTTAGCAGATAGGATTGCTGTTAGGAAAAGCGATAAAATGATGAGTTTGAAGAT  
19AH TTTCTCTTAGCAGATAGGATTGCTGTTAGGAAAAGCGATAAAATGATGAGTTTGAAGAT  
23FPO TTTCTCTTAGCAGATAGGATTGCTGTTAGGAAAAGCGATAAAATGATGAGTTTGAAGAT  
19FTW TTTCTCTTAGCAGATAGGATTGCTGTTAGGAAAAGCGATAAAATGATGAGTTTGAAGAT  
9VSP TTTCTCTTAGCAGATAGGATTGCTGTTAGGAAAAGCGATAAAATGATGAGTTTGAAGAT  
TIGR4 TTTCTCTTAGCAGATAGGATTGCTGTTAGGAAAAGCGATAAAATGATGAGTTTGAAGAT  
23FTW TTTCTCTTAGCAGATAGGATTGCTGTTAGGAAAAGCGATAAAATGATGAGTTTGAAGAT  
\*\*\*\*\*

14CSR AAAGGGATGCTGATAAAAA-TGGTAAAAACAAAAAGCAAAAACGAAATAATCTCCTATT  
670 AAAGGGATGCTGATAAAAA-TGGTAAAAACAAAAAGCAAAAACGAAATAATCTCCTATT  
6BF AAAGGGATGCTGATAAAAA-TGGTAAAAACAAAAAGCAAAAACGAAATAATCTCCTATT  
6BSP AAAGGGATGCTGATAAAAA-TGGTAAAAACAAAAAGCAAAAACGAAATAATCTCCTATT  
19AH AAAGGGATGCTGATAAAAA-TGGTAAAAACAAAAAGCAAAAACGAAATAATCTCCTATT  
23FPO AAAGGAATGCTGATAAAAAATGGCAAAAACAAAAAGCAAAAACGAAACAATCTCCTATT  
19FTW AAAGGAATGCTGATAAAAAATGGCAAAAACAAAAAGCAAAAACGAAACAATCTCCTATT  
9VSP AAAGGAATGCTGATAAAAAATGGCAAAAACAAAAAGCAAAAACGAAACAATCTCCTATT  
TIGR4 AAAGGGATGCTGATAAAAA-TGGTAAAAACAAAAAGCAAAAACGAAATAATCTCCTATT  
23FTW AAAGGGATGCTGATAAAAA-TGGTAAAAACAAAAAGCAAAAACGAAATAATCTCCTATT  
\*\*\*\*\*

14CSR AGGAGTGGTATTTTTTCATTGGAATGGCGGTAATGGCGTATCCGCTGGTGTCTCGCTTGTA  
670 AGGAGTGGTATTTTTTCATTGGAATGGCGGTAATGGCGTATCCGCTGGTGTCTCGCTTGTA  
6BF AGGAGTGGTATTTTTTCATTGGAATGGCGGTAATGGCGTATCCGCTGGTGTCTCGCTTGTA  
6BSP AGGAGTGGTATTTTTTCATTGGAATGGCGGTAATGGCGTATCCGCTGGTGTCTCGCTTGTA  
19AH AGGAGTGGTATTTTTTCATTGGAATGGCGGTAATGGCGTATCCGCTGGTGTCTCGCTTGTA  
23FPO AGGAGTGGTATTTTTTCATTGGAATGGCGGTAATGGCGTATCCGCTGGTGTCTCGCTTGTA  
19FTW AGGAGTGGTATTTTTTCATTGGAATGGCGGTAATGGCGTATCCGCTGGTGTCTCGCTTGTA  
9VSP AGGAGTGGTATTTTTTCATTGGAATGGCGGTAATGGCGTATCCGCTGGTGTCTCGCTTGTA  
TIGR4 AGGAGTGGTATTTTTTCATTGGAATGGCGGTAATGGCGTATCCGCTGGTGTCTCGCTTGTA  
23FTW AGGAGTGGTATTTTTTCATTGGAATGGCGGTAATGGCGTATCCGCTGGTGTCTCGCTTGTA  
\*\*\*\*\*

14CSR TTATCGAGTGAATCAAATCAACAAATTGCTGACTTTGATAAGGAAAAAGCAACGTTGGA  
670 TTATCGAGTGAATCAAATCAACAAATTGCTGACTTTGATAAGGAAAAAGCAACGTTGGA  
6BF TTATCGAGTGAATCAAATCAACAAATTGCTGACTTTGATAAGGAAAAAGCAACGTTGGA  
6BSP TTATCGAGTGAATCAAATCAACAAATTGCTGACTTTGATAAGGAAAAAGCAACGTTGGA  
19AH TTATCGAGTGAATCAAATCAACAAATTGCTGACTTTGATAAGGAAAAAGCAACGTTGGA  
23FPO TTATCGAGTGAATCAAATCAACAAATTGCTGACTTTGATAAGGAAAAAGCAACGTTGGA  
19FTW TTATCGAGTGAATCAAATCAACAAATTGCTGACTTTGATAAGGAAAAAGCAACGTTGGA  
9VSP TTATCGAGTGAATCAAATCAACAAATTGCTGACTTTGATAAGGAAAAAGCAACGTTGGA  
TIGR4 TTATCGAGTGAATCAAATCAACAAATTGCTGACTTTGATAAGGAAAAAGCAACGTTGGA  
23FTW TTATCGAGTGAATCAAATCAACAAATTGCTGACTTTGATAAGGAAAAAGCAACGTTGGA  
\*\*\*\*\*

Figure 196AD

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14CSR TGAGGCTGACATTGATGAACGAATGAAATTGGCACAAAGCCTTCAATGACTCTTTGAATAA  
670 TGAGGCTGACATTGATGAACGAATGAAATTGGCACAAAGCCTTCAATGACTCTTTGAATAA  
6BF TGAGGCTGACATTGATGAACGAATGAAATTGGCACAAAGCCTTCAATGACTCTTTGAATAA  
6BSP TGAGGCTGACATTGATGAACGAATGAAATTGGCACAAAGCCTTCAATGACTCTTTGAATAA  
19AH TGAGGCTGACATTGATGAACGAATGAAATTGGCACAAAGCCTTCAATGACTCTTTGAATAA  
23FPO TGAGGCTGACATTGATGAACGAATGAAATTGGCACAAAGCCTTCAATGACTCTTTGAATAA  
19FTW TGAGGCTGACATTGATGAACGAATGAAATTGGCACAAAGCCTTCAATGACTCTTTGAATAA  
9VSP TGAGGCTGACATTGATGAACGAATGAAATTGGCACAAAGCCTTCAATGACTCTTTGAATAA  
TIGR4 TGAGGCTGACATTGATGAACGAATGAAATTGGCACAAAGCCTTCAATGACTCTTTGAATAA  
23FTW TGAGGCTGACATTGATGAACGAATGAAATTGGCACAAAGCCTTCAATGACTCTTTGAATAA  
\*\*\*\*\*

14CSR TGTAGTGAGTGGCGATCCTTGGTCGGAAGAAATGAAGAAAAAAGGGCGAGCAGAGTATGC  
670 TGTAGTGAGTGGCGATCCTTGGTCGGAAGAAATGAAGAAAAAAGGGCGAGCAGAGTATGC  
6BF TGTAGTGAGTGGCGATCCTTGGTCGGAAGAAATGAAGAAAAAAGGGCGAGCAGAGTATGC  
6BSP TGTAGTGAGTGGCGATCCTTGGTCGGAAGAAATGAAGAAAAAAGGGCGAGCAGAGTATGC  
19AH TGTAGTGAGTGGCGATCCTTGGTCGGAAGAAATGAAGAAAAAAGGGCGAGCAGAGTATGC  
23FPO TGTAGTGAGTGGCGATCCTTGGTCGGAAGAAATGAAGAAAAAAGGGCGAGCAGAGTATGC  
19FTW TGTAGTGAGTGGCGATCCTTGGTCGGAAGAAATGAAGAAAAAAGGGCGAGCAGAGTATGC  
9VSP TGTAGTGAGTGGCGATCCTTGGTCGGAAGAAATGAAGAAAAAAGGGCGAGCAGAGTATGC  
TIGR4 TGTAGTGAGTGGCGATCCTTGGTCGGAAGAAATGAAGAAAAAAGGGCGAGCAGAGTATGC  
23FTW TGTAGTGAGTGGCGATCCTTGGTCGGAAGAAATGAAGAAAAAAGGGCGAGCAGAGTATGC  
\*\*\*\*\*

14CSR ACGTATGTTAGAAATCCATGAGCGGATGGGGCATGTGGAAATCCCCGTTATTGACGTGGA  
670 ACGTATGTTAGAAATCCATGAGCGGATGGGGCATGTGGAAATCCCCGTTATTGACGTGGA  
6BF ACGTATGTTAGAAATCCATGAGCGGATGGGGCATGTGGAAATCCCCGTTATTGACGTGGA  
6BSP ACGTATGTTAGAAATCCATGAGCGGATGGGGCATGTGGAAATCCCCGTTATTGACGTGGA  
19AH ACGTATGTTAGAAATCCATGAGCGGATGGGGCATGTGGAAATCCCCGTTATTGACGTGGA  
23FPO ACGTATGTTAGAAATCCATGAGCGGATGGGGCATGTGGAAATCCCCGTTATTGACGTGGA  
19FTW ACGTATGTTAGAAATCCATGAGCGGATGGGGCATGTGGAAATCCCCGTTATTGACGTGGA  
9VSP ACGTATGTTAGAAATCCATGAGCGGATGGGGCATGTGGAAATCCCCGTTATTGACGTGGA  
TIGR4 ACGTATGTTAGAAATCCATGAGCGGATGGGGCATGTGGAAATCCCCGTTATTGACGTGGA  
23FTW ACGTATGTTAGAAATCCATGAGCGGATGGGGCATGTGGAAATCCCCGTTATTGACGTGGA  
\*\*\* \*\*\*\*\* \*

14CSR TTTGCCGGTTTATGCTGGTACTGCTGAAGAGGTATTGCAGCAAGGGGCTGGGCATCTAGA  
670 TTTGCCGGTTTATGCTGGTACTGCTGAAGAGGTATTGCAGCAAGGGGCTGGGCATCTAGA  
6BF TTTGCCGGTTTATGCTGGTACTGCTGAAGAGGTATTGCAGCAAGGGGCTGGGCATCTAGA  
6BSP TTTGCCGGTTTATGCTGGTACTGCTGAAGAGGTATTGCAGCAAGGGGCTGGGCATCTAGA  
19AH TTTGCCGGTTTATGCTGGTACTGCTGAAGAGGTATTGCAGCAAGGGGCTGGGCATCTAGA  
23FPO TTTGCCGGTTTATGCTGGTACTGCTGAAGAGGTATTGCAGCAAGGGGCTGGGCATCTAGA  
19FTW TTTGCCGGTTTATGCTGGTACTGCTGAAGAGGTATTGCAGCAAGGGGCTGGGCATCTAGA  
9VSP TTTGCCGGTTTATGCTGGTACTGCTGAAGAGGTATTGCAGCAAGGGGCTGGGCATCTAGA  
TIGR4 TTTGCCGGTTTATGCTGGTACTGCTGAAGAGGTATTGCAGCAAGGGGCTGGGCATCTAGA  
23FTW TTTGCCGGTTTATGCTGGTACTGCTGAAGAGGTATTGCAGCAAGGGGCTGGGCATCTAGA  
\*\*\*\*\*

14CSR GGGAACTTCTCTGCCGATCGGAGGCAATTCGACCCATGCGGTGATTACGGCACATACAGG  
670 GGGAACTTCTCTGCCGATCGGAGGCAATTCGACCCATGCGGTGATTACGGCACATACAGG  
6BF GGGAACTTCTCTGCCGATCGGAGGCAATTCGACCCATGCGGTGATTACGGCACATACAGG  
6BSP GGGAACTTCTCTGCCGATCGGAGGCAATTCGACCCATGCGGTGATTACGGCACATACAGG  
19AH GGGAACTTCTCTGCCGATCGGAGGCAATTCGACCCATGCGGTGATTACGGCACATACAGG  
23FPO GGGAACTTCTCTGCCGATCGGAGGCAATTCGACCCATGCGGTGATTACGGCACATACAGG  
19FTW GGGAACTTCTCTGCCGATCGGAGGCAATTCGACCCATGCGGTGATTACGGCACATACAGG  
9VSP GGGAACTTCTCTGCCGATCGGAGGCAATTCGACCCATGCGGTGATTACGGCACATACAGG  
TIGR4 GGGAACTTCTCTGCCGATCGGAGGCAATTCGACCCATGCGGTGATTACGGCACATACAGG  
23FTW GGGAACTTCTCTGCCGATCGGAGGCAATTCGACCCATGCGGTGATTACGGCACATACAGG  
\*\*\*\*\*

Figure 196AE

PCT/US2005/027239

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14CSR TTTGCCAACAGCTAAGATGTTTACGGATTGACCAAACCTTAAAGTTGGGGATAAGTTTTA  
670 TTTGCCAACAGCTAAGATGTTTACGGATTGACCAAACCTTAAAGTTGGGGATAAGTTTTA  
6BF TTTGCCAACAGCTAAGATGTTTACGGATTGACCAAACCTTAAAGTTGGGGATAAGTTTTA  
6BSP TTTGCCAACAGCTAAGATGTTTACGGATTGACCAAACCTTAAAGTTGGGGATAAGTTTTA  
19AH TTTGCCAACAGCTAAGATGTTTACGGATTGACCAAACCTTAAAGTTGGGGATAAGTTTTA  
23FPO TTTGCCAACGGCTAAGATGTTTACGGATTGACCAAACCTTAAAGTTGGGGATAAGTTTTA  
19FTW TTTGCCAACGGCTAAGATGTTTACGGATTGACCAAACCTTAAAGTTGGGGATAAGTTTTA  
9VSP TTTGCCAACGGCTAAGATGTTTACGGATTGACCAAACCTTAAAGTTGGGGATAAGTTTTA  
TIGR4 TTTGCCAACAGCTAAGATGTTTACGGATTGACCAAACCTTAAAGTTGGGGATAAGTTTTA  
23FTW TTTGCCAACAGCTAAGATGTTTACGGATTGACCAAACCTTAAAGTTGGGGATAAGTTTTA  
\*\*\*\*\* \*\*

14CSR TGTGCACAATATCAAGGAAGTGATGGCCTATCAAGTGGATCAAGTAAAGGTGATTGAGCC  
670 TGTGCACAATATCAAGGAAGTGATGGCCTATCAAGTGGATCAAGTAAAGGTGATTGAGCC  
6BF TGTGCACAATATCAAGGAAGTGATGGCCTATCAAGTGGATCAAGTAAAGGTGATTGAGCC  
6BSP TGTGCACAATATCAAGGAAGTGATGGCCTATCAAGTGGATCAAGTAAAGGTGATTGAGCC  
19AH TGTGCACAATATCAAGGAAGTGATGGCCTATCAAGTGGATCAAGTAAAGGTGATTGAGCC  
23FPO TGTGCACAATATCAAGGAAGTGATGGCCTATCAAGTGGATCAAGTAAAGGTGATTGAGCC  
19FTW TGTGCACAATATCAAGGAAGTGATGGCCTATCAAGTGGATCAAGTAAAGGTGATTGAGCC  
9VSP TGTGCACAATATCAAGGAAGTGATGGCCTATCAAGTGGATCAAGTAAAGGTGATTGAGCC  
TIGR4 TGTGCACAATATCAAGGAAGTGATGGCCTATCAAGTGGATCAAGTAAAGGTGATTGAGCC  
23FTW TGTGCACAATATCAAGGAAGTGATGGCCTATCAAGTGGATCAAGTAAAGGTGATTGAGCC  
\*\*\*\*\*

14CSR GACGAACTTTGATGATTTATTGATTGTACCAGGTCATGATTATGTGACCTTGCTGACTTG  
670 GACGAACTTTGATGATTTATTGATTGTACCAGGTCATGATTATGTGACCTTGCTGACTTG  
6BF GACGAACTTTGATGATTTATTGATTGTACCAGGTCATGATTATGTGACCTTGCTGACTTG  
6BSP GACGAACTTTGATGATTTATTGATTGTACCAGGTCATGATTATGTGACCTTGCTGACTTG  
19AH GACGAACTTTGATGATTTATTGATTGTACCAGGTCATGATTATGTGACCTTGCTGACTTG  
23FPO GACGAACTTTGATGATTTATTGATTGTACCAGGTCATGATTATGTGACCTTGCTGACTTG  
19FTW GACGAACTTTGATGATTTATTGATTGTACCAGGTCATGATTATGTGACCTTGCTGACTTG  
9VSP GACGAACTTTGATGATTTATTGATTGTACCAGGTCATGATTATGTGACCTTGCTGACTTG  
TIGR4 GACGAACTTTGATGATTTATTGATTGTACCAGGTCATGATTATGTGACCTTGCTGACTTG  
23FTW GACGAACTTTGATGATTTATTGATTGTACCAGGTCATGATTATGTGACCTTGCTGACTTG  
\*\*\*\*\* \*\*

14CSR TACGCCATACATGATCAATACCCATCGTCTATTGGTTCGGGGGCATCGGATACCGTACGT  
670 TACGCCATACATGATCAATACCCATCGTCTATTGGTTCGGGGGCATCGGATACCGTACGT  
6BF TACGCCATACATGATCAATACCCATCGTCTATTGGTTCGGGGGCATCGGATACCGTACGT  
6BSP TACGCCATACATGATCAATACCCATCGTCTATTGGTTCGGGGGCATCGGATACCGTACGT  
19AH TACGCCATACATGATCAATACCCATCGTCTATTGGTTCGGGGGCATCGGATACCGTACGT  
23FPO TACGCCATACATGATCAATACCCATCGTCTATTGGTTCGGGGGCATCGGATACCGTACGT  
19FTW TACGCCATACATGATCAATACCCATCGTCTATTGGTTCGGGGGCATCGGATACCGTACGT  
9VSP TACGCCATACATGATCAATACCCATCGTCTATTGGTTCGGGGGCATCGGATACCGTACGT  
TIGR4 TACGCCATACATGATCAATACCCATCGTCTATTGGTTCGGGGGCATCGGATACCGTACGT  
23FTW TACGCCATACATGATCAATACCCATCGTCTATTGGTTCGGGGGCATCGGATACCGTACGT  
\*\*\*\*\*

14CSR AGCAGAGGTTGAGGAAGAATTTATTGCAGCAAACAACTCAGTCATCTCTATCGCTACCT  
670 AGCAGAGGTTGAGGAAGAATTTATTGCAGCAAACAACTCAGTCATCTCTATCGCTACCT  
6BF AGCAGAGGTTGAGGAAGAATTTATTGCAGCAAACAACTCAGTCATCTCTATCGCTACCT  
6BSP AGCAGAGGTTGAGGAAGAATTTATTGCAGCAAACAACTCAGTCATCTCTATCGCTACCT  
19AH AGCAGAGGTTGAGGAAGAATTTATTGCAGCAAACAACTCAGTCATCTCTATCGCTACCT  
23FPO AGCAGAGGTTGAGGAAGAATTTATTGCGGCAAACAACTCAGTCATCTCTATCGCTACCT  
19FTW AGCAGAGGTTGAGGAAGAATTTATTGCGGCAAACAACTCAGTCATCTCTATCGCTACCT  
9VSP AGCAGAGGTTGAGGAAGAATTTATTGCGGCAAACAACTCAGTCATCTCTATCGCTACCT  
TIGR4 AGCAGAGGTTGAGGAAGAATTTATTGCAGCAAACAACTCAGTCATCTCTATCGCTACCT  
23FTW AGCAGAGGTTGAGGAAGAATTTATTGCAGCAAACAACTCAGTCATCTCTATCGCTACCT  
\*\*\*\*\*

Figure 196AF

14CSR GTTTTATGTGGCAGTTGGTTTGATTGTGATTCTTTTATGGATTATTTCGACGCTTGCGCAA  
670 GTTTTATGTGGCAGTTGGTTTGATTGTGATTCTTTTATGGATTATTTCGACGCTTGCGCAA  
6BF GTTTTATGTGGCAGTTGGTTTGATTGTGATTCTTTTATGGATTATTTCGACGCTTGCGCAA  
6BSP GTTTTATGTGGCAGTTGGTTTGATTGTGATTCTTTTATGGATTATTTCGACGCTTGCGCAA  
19AH GTTTTATGTGGCAGTTGGTTTGATTGTGATTCTTTTATGGATTATTTCGACGCTTGCGCAA  
23FPO GTTTTATGTGGCAGTTGGTTTGATTGTGATTCTTTTATGGATTATTTCGACGCTTGCGCAA  
19FTW GTTTTATGTGGCAGTTGGTTTGATTGTGATTCTTTTATGGATTATTTCGACGCTTGCGCAA  
9VSP GTTTTATGTGGCAGTTGGTTTGATTGTGATTCTTTTATGGATTATTTCGACGCTTGCGCAA  
TIGR4 GTTTTATGTGGCAGTTGGTTTGATTGTGATTCTTTTATGGATTATTTCGACGCTTGCGCAA  
23FTW GTTTTATGTGGCAGTTGGTTTGATTGTGATTCTTTTATGGATTATTTCGACGCTTGCGCAA  
\*\*\*\*\*

14CSR GAAGAAAAACAACCGGAAAAGGCTTTGAAGGCGCTGAAAGCAGCAAGGAAGGAAGTGAA  
670 GAAGAAAAACAACCGGAAAAGGCTTTGAAGGCGCTGAAAGCAGCAAGGAAGGAAGTGAA  
6BF GAAGAAAAACAACCGGAAAAGGCTTTGAAGGCGCTGAAAGCAGCAAGGAAGGAAGTGAA  
6BSP GAAGAAAAACAACCGGAAAAGGCTTTGAAGGCGCTGAAAGCAGCAAGGAAGGAAGTGAA  
19AH GAAGAAAAACAACCGGAAAAGGCTTTGAAGGCGCTGAAAGCAGCAAGGAAGGAAGTGAA  
23FPO GAAGAAACGGCAATCAGAAAGAGCTTTGAAAGCATTGAAGGAAGCTACTAAGGAAGTGAA  
19FTW GAAGAAACGGCAATCAGAAAGAGCTTTGAAAGCATTGAAGGAAGCTACTAAGGAAGTGAA  
9VSP GAAGAAACGGCAATCAGAAAGAGCTTTGAAAGCATTGAAGGAAGCTACTAAGGAAGTGAA  
TIGR4 GAAGAAAAACAACCGGAAAAGGCTTTGAAGGCGCTGAAAGCAGCAAGGAAGGAAGTGAA  
23FTW GAAGAAAAACAACCGGAAAAGGCTTTGAAGGCGCTGAAAGCAGCAAGGAAGGAAGTGAA  
\*\*\*\*\* \* \* \* \* \*

14CSR GGTGGAGGATGGACAACAGTAGACGTTTACGAAAAAAGGCACAAAAAAGAAGAAACATC  
670 GGTGGAGGATGGACAACAGTAGACGTTTACGAAAAAAGGCACAAAAAAGAAGAAACATC  
6BF GGTGGAGGATGGACAACAGTAGACGTTTACGAAAAAAGGCACAAAAAAGAAGAAACATC  
6BSP GGTGGAGGATGGACAACAGTAGACGTTTACGAAAAAAGGCACAAAAAAGAAGAAACATC  
19AH GGTGGAGGATGGACAACAGTAGACGTTTACGAAAAAAGGCACAAAAAAGAAGAAACATC  
23FPO GGTAGAGGATGAGTAAGAGTAGATATTACGGAAGAAAGAGCGTGAAAAAGAAAGAAATC  
19FTW GGTAGAGGATGAGTAAGAGTAGATATTACGGAAGAAAGAGCGTGAAAAAGAAAGAAATC  
9VSP GGTAGAGGATGAGTAAGAGTAGATATTACGGAAGAAAGAGCGTGAAAAAGAAAGAAATC  
TIGR4 GGTGGAGGATGGACAACAGTAGACGTTTACGAAAAAAGGCACAAAAAAGAAGAAACATC  
23FTW GGTGGAGGATGGACAACAGTAGACGTTTACGAAAAAAGGCACAAAAAAGAAGAAACATC  
\*\*\* \* \* \* \* \*

14CSR CGCTGATCCTTCTTCTGATTTTCTTAGTAGGATTGCGCGTTGCGATATATCCATTGGTGT  
670 CGCTGATCCTTCTTCTGATTTTCTTAGTAGGATTGCGCGTTGCGATATATCCATTGGTGT  
6BF CGCTGATCCTTCTTCTGATTTTCTTAGTAGGATTGCGCGTTGCGATATATCCATTGGTGT  
6BSP CGCTGATCCTTCTTCTGATTTTCTTAGTAGGATTGCGCGTTGCGATATATCCATTGGTGT  
19AH CGCTGATCCTTCTTCTGATTTTCTTAGTAGGATTGCGCGTTGCGATATATCCATTGGTGT  
23FPO CGTTCATTCTTCTTCTGATTTTTTGGTGGGGCTTGCCGTTGCGATGTATCCCTTGGTGT  
19FTW CGTTCATTCTTCTTCTGATTTTTTGGTGGGGCTTGCCGTTGCGATGTATCCCTTGGTGT  
9VSP CGTTCATTCTTCTTCTGATTTTTTGGTGGGGCTTGCCGTTGCGATGTATCCCTTGGTGT  
TIGR4 CGCTGATCCTTCTTCTGATTTTCTTAGTAGGATTGCGCGTTGCGATATATCCATTGGTGT  
23FTW CGCTGATCCTTCTTCTGATTTTCTTAGTAGGATTGCGCGTTGCGATATATCCATTGGTGT  
\* \* \* \* \*

14CSR CTCGTTATTATTATCGTATTGAGTCAAACGAGGTTATTAAGAGTTTGATGAGACGGTTT  
670 CTCGTTATTATTATCGTATTGAGTCAAACGAGGTTATTAAGAGTTTGATGAGACGGTTT  
6BF CTCGTTATTATTATCGTATTGAGTCAAACGAGGTTATTAAGAGTTTGATGAGACGGTTT  
6BSP CTCGTTATTATTATCGTATTGAGTCAAACGAGGTTATTAAGAGTTTGATGAGACGGTTT  
19AH CTCGTTATTATTATCGTATTGAGTCAAACGAGGTTATTAAGAGTTTGATGAGACGGTTT  
23FPO CTCGTTATTATTATCGTATTGAGTCAAACGAGGTTATTAAGAGTTTGATGAGACGGTTT  
19FTW CTCGTTATTATTATCGTATTGAGTCAAACGAGGTTATTAAGAGTTTGATGAGACGGTTT  
9VSP CTCGTTATTATTATCGTATTGAGTCAAACGAGGTTATTAAGAGTTTGATGAGACGGTTT  
TIGR4 CTCGTTATTATTATCGTATTGAGTCAAACGAGGTTATTAAGAGTTTGATGAGACGGTTT  
23FTW CTCGTTATTATTATCGTATTGAGTCAAACGAGGTTATTAAGAGTTTGATGAGACGGTTT  
\*\*\*\*\*

14CSR CCCAGATGGATAAGGCAGAACTTGAGGAGCGTTGGCGCTTGGCTCAAGCCTTCAATGCGA  
670 CCCAGATGGATAAGGCAGAACTTGAGGAGCGTTGGCGCTTGGCTCAAGCCTTCAATGCGA  
6BF CCCAGATGGATAAGGCAGAACTTGAGGAGCGTTGGCGCTTGGCTCAAGCCTTCAATGCGA  
6BSP CCCAGATGGATAAGGCAGAACTTGAGGAGCGTTGGCGCTTGGCTCAAGCCTTCAATGCGA  
19AH CCCAGATGGATAAGGCAGAACTTGAGGAGCGTTGGCGCTTGGCTCAAGCCTTCAATGCGA  
23FPO CCCAGATGGATAAGGCAGAACTTGAGGAGCGTTGGCGCTTGGCTCAAGCCTTCAATGCGA  
19FTW CCCAGATGGATAAGGCAGAACTTGAGGAGCGTTGGCGCTTGGCTCAAGCCTTCAATGCGA  
9VSP CCCAGATGGATAAGGCAGAACTTGAGGAGCGTTGGCGCTTGGCTCAAGCCTTCAATGCGA  
TIGR4 CCCAGATGGATAAGGCAGAACTTGAGGAGCGTTGGCGCTTGGCTCAAGCCTTCAATGCGA  
23FTW CCCAGATGGATAAGGCAGAACTTGAGGAGCGTTGGCGCTTGGCTCAAGCCTTCAATGCGA  
\*\*\*\*\*

14CSR CCTTGAAACCATCTGAAATTCCTGATCCTTTTACAGAGCAAGAGAAAAAGAAAGGCGTCT  
670 CCTTGAAACCATCTGAAATTCCTGATCCTTTTACAGAGCAAGAGAAAAAGAAAGGCGTCT  
6BF CCTTGAAACCATCTGAAATTCCTGATCCTTTTACAGAGCAAGAGAAAAAGAAAGGCGTCT  
6BSP CCTTGAAACCATCTGAAATTCCTGATCCTTTTACAGAGCAAGAGAAAAAGAAAGGCGTCT  
19AH CCTTGAAACCATCTGAAATTCCTGATCCTTTTACAGAGCAAGAGAAAAAGAAAGGCGTCT  
23FPO CCTTGAAACCATCTGAAATTCCTGATCCTTTTACAGAGCAAGAGAAAAAGAAAGGCGTCT  
19FTW CCTTGAAACCATCTGAAATTCCTGATCCTTTTACAGATCAGGAAAAGAACAGGGAGTTT  
9VSP CCTTGAAACCATCTGAAATTCCTGATCCTTTTACAGAGCAAGAGAAAAAGAAAGGCGTCT  
TIGR4 CCTTGAAACCATCTGAAATTCCTGATCCTTTTACAGAGCAAGAGAAAAAGAAAGGCGTCT  
23FTW CCTTGAAACCATCTGAAATTCCTGATCCTTTTACAGAGCAAGAGAAAAAGAAAGGCGTCT  
\*\*\*\*\*

14CSR CAGAATATGCCAATATGCTAAAGGTCCATGAGCGGATTGGCTATGTGGAAATTCCTGCGA  
670 CAGAATATGCCAATATGCTAAAGGTCCATGAGCGGATTGGCTATGTGGAAATTCCTGCGA  
6BF CAGAATATGCCAATATGCTAAAGGTCCATGAGCGGATTGGCTATGTGGAAATTCCTGCGA  
6BSP CAGAATATGCCAATATGCTAAAGGTCCATGAGCGGATTGGCTATGTGGAAATTCCTGCGA  
19AH CAGAATATGCCAATATGCTAAAGGTCCATGAGCGGATTGGCTATGTGGAAATTCCTGCGA  
23FPO CAGAATATGCCAATATGCTAAAGGTCCATGAGCGGATTGGCTATGTGGAAATTCCTGCGA  
19FTW CAGAATATGCTAACATGCTAAAGTTCATGAGCGTATCGGATATGTAGAAATTCCTGCGA  
9VSP CAGAATATGCCAATATGCTAAAGGTCCATGAGCGGATTGGCTATGTGGAAATTCCTGCGA  
TIGR4 CAGAATATGCCAATATGCTAAAGGTCCATGAGCGGATTGGCTATGTGGAAATTCCTGCGA  
23FTW CAGAATATGCCAATATGCTAAAGGTCCATGAGCGGATTGGCTATGTGGAAATTCCTGCGA  
\*\*\*\*\*

14CSR TTGATCAGGAAATTCGGATGTATGTGCGAACGAGTGAGGAAATTCCTCAGAAGGGCGCAG  
670 TTGATCAGGAAATTCGGATGTATGTGCGAACGAGTGAGGAAATTCCTCAGAAGGGCGCAG  
6BF TTGATCAGGAAATTCGGATGTATGTGCGAACGAGTGAGGAAATTCCTCAGAAGGGCGCAG  
6BSP TTGATCAGGAAATTCGGATGTATGTGCGAACGAGTGAGGAAATTCCTCAGAAGGGCGCAG  
19AH TTGATCAGGAAATTCGGATGTATGTGCGAACGAGTGAGGAAATTCCTCAGAAGGGCGCAG  
23FPO TTGATCAGGAAATTCGGATGTATGTGCGAACGAGTGAGGAAATTCCTCAGAAGGGCGCAG  
19FTW TTGAACAGGAAATCCCATGTATGTTGGCACAGTGAAGACATTCCTCAGAAAGGGCGCAG  
9VSP TTGATCAGGAAATTCGGATGTATGTGCGAACGAGTGAGGAAATTCCTCAGAAGGGCGCAG  
TIGR4 TTGATCAGGAAATTCGGATGTATGTGCGAACGAGTGAGGAAATTCCTCAGAAGGGCGCAG  
23FTW TTGATCAGGAAATTCGGATGTATGTGCGAACGAGTGAGGAAATTCCTCAGAAGGGCGCAG  
\*\*\*\*\*

14CSR GATTGCTAGAGGGAGCTTCGTTACCGGTTGGTGGTGAAAATACCCACACAGTTGTCACTG  
670 GATTGCTAGAGGGAGCTTCGTTACCGGTTGGTGGTGAAAATACCCACACAGTTGTCACTG  
6BF GATTGCTAGAGGGAGCTTCGTTACCGGTTGGTGGTGAAAATACCCACACAGTTGTCACTG  
6BSP GATTGCTAGAGGGAGCTTCGTTACCGGTTGGTGGTGAAAATACCCACACAGTTGTCACTG  
19AH GATTGCTAGAGGGAGCTTCGTTACCGGTTGGTGGTGAAAATACCCACACAGTTGTCACTG  
23FPO GATTGCTAGAGGGAGCTTCGTTACCGGTTGGTGGTGAAAATACCCACACAGTTGTCACTG  
19FTW GGCTGTTAGAAGGGGCTTCGCTGCCTGTTGGAGGTGAAAATACCCATACAGTGATCACTG  
9VSP GATTGCTAGAGGGAGCTTCGTTACCGGTTGGTGGTGAAAATACCCACACAGTTGTCACTG  
TIGR4 GGCTGTTAGAAGGGGCTTCGCTGCCTGTTGGAGGTGAAAATACCCATACAGTGATCACTG  
23FTW GATTGCTAGAGGGAGCTTCGTTACCGGTTGGTGGTGAAAATACCCACACAGTTGTCACTG  
\* \* \* \* \*

PCT/US05/27239

427/487

14CSR CTCATAGAGGATTACCGACGGCAGAACTGTTTAGTCAATTGGATAAGATGAAAAAAGGGG  
670 CTCATAGAGGATTACCGACGGCAGAACTGTTTAGTCAATTGGATAAGATGAAAAAAGGGG  
6BF CTCATAGAGGATTACCGACGGCAGAACTGTTTAGTCAATTGGATAAGATGAAAAAAGGGG  
6BSP CTCATAGAGGATTACCGACGGCAGAACTGTTTAGTCAATTGGATAAGATGAAAAAAGGGG  
19AH CTCATAGAGGATTACCGACGGCAGAACTGTTTAGTCAATTGGATAAGATGAAAAAAGGGG  
23FPO CTCATAGAGGATTACCGACGGCAGAACTGTTTAGTCAATTGGATAAGATGAAAAAAGGGG  
19FTW CTCACAGAGGATTGCCAACGGCAGAACTGTTTCACTCAATTGGATAAGATGAAGAAAGGGG  
9VSP CTCACAGAGGATTGCCAACGGCAGAACTGTTTAGTCAATTGGATAAGATGAAAAAAGGGG  
TIGR4 CTCACAGAGGATTGCCAACGGCAGAACTGTTTCACTCAATTGGATAAGATGAAAAAAGGGG  
23FTW CTCATAGAGGATTACCGACGGCAGAACTGTTTAGTCAATTGGATAAGATGAAAAAAGGGG  
\*\*\*\*\*

14CSR ATGTCTTTTATCTTCACGTTTTAGACCAGGTGTTGGCCTACCAAGTGGATCAGATTTTGA  
670 ATGTCTTTTATCTTCACGTTTTAGACCAGGTGTTGGCCTACCAAGTGGATCAGATTTTGA  
6BF ATGTCTTTTATCTTCACGTTTTAGACCAGGTGTTGGCCTACCAAGTGGATCAGATTTTGA  
6BSP ATGTCTTTTATCTTCACGTTTTAGACCAGGTGTTGGCCTACCAAGTGGATCAGATTTTGA  
19AH ATGTCTTTTATCTTCACGTTTTAGACCAGGTGTTGGCCTACCAAGTGGATCAGATTTTGA  
23FPO ATATCTTTTATCTTCACGTTTTAGATCAGGTGTTGGCCTACCAAGTGGATCAGATAGTGA  
19FTW ATATCTTTTATCTTCACGTTTTAGACCAGGTGTTGGCCTATCAAGTGGATCAGATAGTGA  
9VSP ATATCTTTTATCTTCACGTTTTAGATCAGGTGTTGGCCTACCAAGTGGATCAGATAGTGA  
TIGR4 ATATCTTTTATCTTCACGTTTTAGATCAGGTGTTGGCCTACCAAGTGGATCAGATAGTGA  
23FTW ATGTCTTTTATCTTCACGTTTTAGACCAGGTGTTGGCCTACCAAGTGGATCAGATTTTGA  
\*\* \*\*\*\*\*

14CSR CGGTTGAGCCAAATGACTTTGAGCCTGTCTTGATTCAACATGGGGAAGATTATGCGACCT  
670 CGGTTGAGCCAAATGACTTTGAGCCTGTCTTGATTCAACATGGGGAAGATTATGCGACCT  
6BF CGGTTGAGCCAAATGACTTTGAGCCTGTCTTGATTCAACATGGGGAAGATTATGCGACCT  
6BSP CGGTTGAGCCAAATGACTTTGAGCCTGTCTTGATTCAACATGGGGAAGATTATGCGACCT  
19AH CGGTTGAGCCAAATGACTTTGAGCCTGTCTTGATTCAACATGGGGAAGATTATGCGACCT  
23FPO CGGTTGAGCCGAATGACTTTGAGCCTGTCTTGATTCAACATGGGGAAGATTATGCGACCT  
19FTW CGGTTGAGCCGAATGATTTTGAAGCCTGTCTTGATTCAACATGGGGAAGATTATGCGACCT  
9VSP CGGTTGAGCCGAATGACTTTGAGCCTGTCTTGATTCAACATGGGGAAGATTATGCGACCT  
TIGR4 CGGTTGAGCCGAATGACTTTGAGCCTGTCTTGATTCAACATGGGGAAGATTATGCGACCT  
23FTW CGGTTGAGCCAAATGACTTTGAGCCTGTCTTGATTCAACATGGGGAAGATTATGCGACCT  
\*\*\*\*\*

14CSR TGTTGACCTGTACACCGTATATGATTAACAGTCATCGTCTGTTGGTACGTGGGAAGCGGA  
670 TGTTGACCTGTACACCGTATATGATTAACAGTCATCGTCTGTTGGTACGTGGGAAGCGGA  
6BF TGTTGACCTGTACACCGTATATGATTAACAGTCATCGTCTGTTGGTACGTGGGAAGCGGA  
6BSP TGTTGACCTGTACACCGTATATGATTAACAGTCATCGTCTGTTGGTACGTGGGAAGCGGA  
19AH TGTTGACCTGTACACCGTATATGATTAACAGTCATCGTCTGTTGGTACGTGGGAAGCGGA  
23FPO TGTTGACTTGTACACCGTATATGATTAACAGTCATCGTCTGTTGGTACGTGGGAAGCGGA  
19FTW TACTGACTTGTACGCCATACATGATTAACAGCCACCGTTGTTGGTACGTGGGAAGCGGA  
9VSP TGTTGACTTGTACACCGTATATGATTAACAGTCATCGTCTGTTGGTACGTGGGAAGCGGA  
TIGR4 TGTTGACTTGTACACCGTATATGATTAACAGTCATCGTCTGTTGGTACGTGGGAAGCGGA  
23FTW TGTTGACCTGTACACCGTATATGATTAACAGTCATCGTCTGTTGGTACGTGGGAAGCGGA  
\* \*\*\*\*\*

14CSR TTCCGTATACGGCACCAATTGCAGAGCGAAATCGAGCGGTGAGAGAGCGTGGGCAATTCT  
670 TTCCGTATACGGCACCAATTGCAGAGCGAAATCGAGCGGTGAGAGAGCGTGGGCAATTCT  
6BF TTCCGTATACGGCACCAATTGCAGAGCGAAATCGAGCGGTGAGAGAGCGTGGGCAATTCT  
6BSP TTCCGTATACGGCACCAATTGCAGAGCGAAATCGAGCGGTGAGAGAGCGTGGGCAATTCT  
19AH TTCCGTATACGGCACCAATTGCAGAGCGAAATCGAGCGGTGAGAGAGCGTGGGCAATTCT  
23FPO TTCCGTATACGGCACCAATTGCAGAGCGAAATCGAGCGGTGAGAGAGCGTGGGCAATTCT  
19FTW TTCCATATACAGCGCCGATTGCTGAGCGGAATCGAGCGGTGAGAGAGCGTGGGCAATTCT  
9VSP TTCCGTATACGGCACCAATTGCAGAGCGAAATCGAGCGGTGAGAGAGCGTGGGCAATTCT  
TIGR4 TTCCGTATACGGCACCAATTGCAGAGCGAAATCGAGCGGTGAGAGAGCGTGGGCAATTCT  
23FTW TTCCGTATACGGCACCAATTGCAGAGCGAAATCGAGCGGTGAGAGAGCGTGGGCAATTCT  
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Figure 196I

14CSR GGTGTGGTTATTGCTAGCGGCGTTGGTTATGATTCTGGTATTGAGTTACGGGGTGTATC  
670 GGTGTGGTTATTGCTAGCGGCGTTGGTTATGATTCTGGTATTGAGTTACGGGGTGTATC  
6BF GGTGTGGTTATTGCTAGCGGCGTTGGTTATGATTCTGGTATTGAGTTACGGGGTGTATC  
6BSP GGTGTGGTTATTGCTAGCGGCGTTGGTTATGATTCTGGTATTGAGTTACGGGGTGTATC  
19AH GGTGTGGTTATTGCTAGCGGCGTTGGTTATGATTCTGGTATTGAGTTACGGGGTGTATC  
23FPO GGTGTGGTTATTACTAGGAGCGATGGCGGTATCCTTCTCTTGTGTATCGCGTGTATC  
19FTW GGTGTGGTTATTACTAGGAGCGATGGCGGTATCCTTCTCTTGTGTATCGCGTGTATC  
9VSP GGTGTGGTTATTACTAGGAGCGATGGCGGTATCCTTCTCTTGTGTATCGCGTGTATC  
TIGR4 GGTGTGGTTATTACTAGGAGCGATGGCGGTATCCTTCTCTTGTGTATCGCGTGTATC  
23FTW GGTGTGGTTATTGCTAGCGGCGTTGGTTATGATTCTGGTATTGAGTTACGGGGTGTATC  
\*\*\*\*\*

14CSR GTCATCGTCGCATTGTCAAAGGGCTAGAAAAACAATTGGAGGAGCATCATGTCAAAGGCT  
670 GTCATCGTCGCATTGTCAAAGGGCTAGAAAAACAATTGGAGGAGCATCATGTCAAAGGCT  
6BF GTCATCGTCGCATTGTCAAAGGGCTAGAAAAACAATTGGAGGAGCATCATGTCAAAGGCT  
6BSP GTCATCGTCGCATTGTCAAAGGGCTAGAAAAACAATTGGAGGAGCATCATGTCAAAGGCT  
19AH GTCATCGTCGCATTGTCAAAGGGCTAGAAAAACAATTGGAGGAGCATCATGTCAAAGGCT  
23FPO GTAATCGACGGATTGTCAAAGGACTAGAAAAGCAATTGGAGGGGCGTCATGTCAAAGGACT  
19FTW GTAATCGACGGATTGTCAAAGGACTAGAAAAGCAATTGGAGGGGCGTCATGTCAAAGGACT  
9VSP GTAATCGACGGATTGTCAAAGGACTAGAAAAGCAATTGGAGGGGCGTCATGTCAAAGGACT  
TIGR4 GTAATCGACGGATTGTCAAAGGACTAGAAAAGCAATTGGAGGGGCGTCATGTCAAAGGACT  
23FTW GTCATCGTCGCATTGTCAAAGGGCTAGAAAAACAATTGGAGGAGCATCATGTCAAAGGCT  
\*\* \* \* \* \*

14CSR AAGCTACAGAAATTACTAGGGTATTTGCTGATGCTGGTAGCATTGGTGATTCCTGTTTAT  
670 AAGCTACAGAAATTACTAGGGTATTTGCTGATGCTGGTAGCATTGGTGATTCCTGTTTAT  
6BF AAGCTACAGAAATTACTAGGGTATTTGCTGATGCTGGTAGCATTGGTGATTCCTGTTTAT  
6BSP AAGCTACAGAAATTACTAGGGTATTTGCTGATGCTGGTAGCATTGGTGATTCCTGTTTAT  
19AH AAGCTACAGAAATTACTAGGGTATTTGCTGATGCTGGTAGCATTGGTGATTCCTGTTTAT  
23FPO AAATACGAGCCTTATTGGGATACTTGTGTGATGTTGGTAGCCTGTTTGATTCCTATTTAT  
19FTW AAATACGAGCCTTATTGGGATACTTGTGTGATGTTGGTAGCCTGTTTGATTCCTATTTAT  
9VSP AAATACGAGCCTTATTGGGATACTTGTGTGATGTTGGTAGCCTGTTTGATTCCTATTTAT  
TIGR4 AAATACGAGCCTTATTGGGATACTTGTGTGATGTTGGTAGCCTGTTTGATTCCTATTTAT  
23FTW AAGCTACAGAAATTACTAGGGTATTTGCTGATGCTGGTAGCATTGGTGATTCCTGTTTAT  
\*\* \* \* \*

14CSR TGTTTTGGGCAGATGGTGTTACAGTCTTTAGGACAAGTAAAAGGTCATGAGATATTTTCA  
670 TGTTTTGGGCAGATGGTGTTACAGTCTTTAGGACAAGTAAAAGGTCATGAGATATTTTCA  
6BF TGTTTTGGGCAGATGGTGTTACAGTCTTTAGGACAAGTAAAAGGTCATGAGATATTTTCA  
6BSP TGTTTTGGGCAGATGGTGTTACAGTCTTTAGGACAAGTAAAAGGTCATGAGATATTTTCA  
19AH TGTTTTGGGCAGATGGTGTTACAGTCTTTAGGACAAGTAAAAGGTCATGAGATATTTTCA  
23FPO TGTTTTGGGCAGATGGTGTTGACAGTCTCTTGGACAGGTGAAAGGTCATGCTACATTTGTG  
19FTW TGTTTTGGGCAGATGGTGTTGACAGTCTCTTGGACAGGTGAAAGGTCATGCTACATTTGTG  
9VSP TGTTTTGGGCAGATGGTGTTGACAGTCTCTTGGACAGGTGAAAGGTCATGCTACATTTGTG  
TIGR4 TGTTTTGGGCAGATGGTGTTGACAGTCTCTTGGACAGGTGAAAGGTCATGCTACATTTGTG  
23FTW TGTTTTGGGCAGATGGTGTTACAGTCTTTAGGACAAGTAAAAGGTCATGAGATATTTTCA  
\*\*\*\*\*

14CSR GAATCTGTGACGGCCGACAGTTACCAAGAGCAATTGCAACGGTCGCTTGATTACAATCAA  
670 GAATCTGTGACGGCCGACAGTTACCAAGAGCAATTGCAACGGTCGCTTGATTACAATCAA  
6BF GAATCTGTGACGGCCGACAGTTACCAAGAGCAATTGCAACGGTCGCTTGATTACAATCAA  
6BSP GAATCTGTGACGGCCGACAGTTACCAAGAGCAATTGCAACGGTCGCTTGATTACAATCAA  
19AH GAATCTGTGACGGCCGACAGTTACCAAGAGCAATTGCAACGGTCGCTTGATTACAATCAA  
23FPO AAATCCATGACAACCTGAAATGTACCAAGAACAACAGAACCATTCTCTCGCCTACAATCAA  
19FTW AAATCCATGACAACCTGAAATGTACCAAGAACAACAGAACCATTCTCTCGCCTACAATCAA  
9VSP AAATCCATGACAACCTGAAATGTACCAAGAACAACAGAACCATTCTCTCGCCTACAATCAA  
TIGR4 AAATCCATGACAACCTGAAATGTACCAAGAACAACAGAACCATTCTCTCGCCTACAATCAA  
23FTW GAATCTGTGACGGCCGACAGTTACCAAGAGCAATTGCAACGGTCGCTTGATTACAATCAA  
\*\*\*\*\*

Figure 196AJ



PCT/US2005/027239 429/487

```
14CSR      CGCTTGGATTTCGCAAAATCGTATTGTAGATCCTTTTTTGGCGGAAGGGTATGAGGTAAAT
670        CGCTTGGATTTCGCAAAATCGTATTGTAGATCCTTTTTTGGCGGAAGGGTATGAGGTAAAT
6BF        CGCTTGGATTTCGCAAAATCGTATTGTAGATCCTTTTTTGGCGGAAGGGTATGAGGTAAAT
6BSP       CGCTTGGATTTCGCAAAATCGTATTGTAGATCCTTTTTTGGCGGAAGGGTATGAGGTAAAT
19AH       CGCTTGGATTTCGCAAAATCGTATTGTAGATCCTTTTTTGGCGGAAGGGTATGAGGTAAAT
23FPO      CGCTTGGCTTCGCAAAATCGCATTGTAGATCCTTTTTTGGCGGAGGGATATGAGGTCAAT
19FTW      CGCTTGGCTTCGCAAAATCGCATTGTAGATCCTTTTTTGGCGGAGGGATATGAGGTCAAT
9VSP       CGCTTGGCTTCGCAAAATCGCATTGTAGATCCTTTTTTGGCGGAGGGATATGAGGTCAAT
TIGR4      CGCTTGGCTTCGCAAAATCGCATTGTAGATCCTTTTTTGGCGGAGGGATATGAGGTCAAT
23FTW      CGCTTGGATTTCGCAAAATCGTATTGTAGATCCTTTTTTGGCGGAAGGGTATGAGGTAAAT
*****

14CSR      TACCAAGTGTCTGACGATCCTGATGCAGTCTACGGCTATTTGTCGATTCCGAGTTTGGAA
670        TACCAAGTGTCTGACGATCCTGATGCAGTCTACGGCTATTTGTCGATTCCGAGTTTGGAA
6BF        TACCAAGTGTCTGACGATCCTGATGCAGTCTACGGCTATTTGTCGATTCCGAGTTTGGAA
6BSP       TACCAAGTGTCTGACGATCCTGATGCAGTCTACGGCTATTTGTCGATTCCGAGTTTGGAA
19AH       TACCAAGTGTCTGACGATCCTGATGCAGTCTACGGCTATTTGTCGATTCCGAGTTTGGAA
23FPO      TACCAAGTGTCTGACGACCTGATGCAGTCTATGGTTACTTGTCTATTCCAAGTTTGGAA
19FTW      TACCAAGTGTCTGACGACCTGATGCAGTCTATGGTTACTTGTCTATTCCAAGTTTGGAA
9VSP       TACCAAGTGTCTGACGACCTGATGCAGTCTATGGTTACTTGTCTATTCCAAGTTTGGAA
TIGR4      TACCAAGTGTCTGACGACCTGATGCAGTCTATGGTTACTTGTCTATTCCAAGTTTGGAA
23FTW      TACCAAGTGTCTGACGATCCTGATGCAGTCTACGGCTATTTGTCGATTCCGAGTTTGGAA
*****

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670        ATCATGGAGCCAGTTTATCTAGGAGCGGATTACCATCATTTAGCAATGGGGTTGGCCCAT
6BF        ATCATGGAGCCAGTTTATCTAGGAGCGGATTACCATCATTTAGCAATGGGGTTGGCCCAT
6BSP       ATCATGGAGCCAGTTTATCTAGGAGCGGATTACCATCATTTAGCAATGGGGTTGGCCCAT
19AH       ATCATGGAGCCAGTTTATCTAGGAGCGGATTACCATCATTTAGCAATGGGGTTGGCCCAT
23FPO      ATCATGGAGCCGTTTATTTGGGAGCAGATTATCATCATTTAGGGATGGGCTTGGCTCAT
19FTW      ATCATGGAGCCGTTTATTTGGGAGCAGATTATCATCATTTAGGGATGGGCTTGGCTCAT
9VSP       ATCATGGAGCCGTTTATTTGGGAGCAGATTATCATCATTTAGGGATGGGCTTGGCTCAT
TIGR4      ATCATGGAGCCGTTTATTTGGGAGCAGATTATCATCATTTAGGGATGGGCTTGGCTCAT
23FTW      ATCATGGAGCCAGTTTATCTAGGAGCGGATTACCATCATTTAGCAATGGGGTTGGCCCAT
*****

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670        GTGGATGGGACGCCTCTTCCGTGTTGAGGGAAAAGGGATTTCGTTCAGTGATTGCTGGGCAC
6BF        GTGGATGGGACGCCTCTTCCGTGTTGAGGGAAAAGGGATTTCGTTCAGTGATTGCTGGGCAC
6BSP       GTGGATGGGACGCCTCTTCCGTGTTGAGGGAAAAGGGATTTCGTTCAGTGATTGCTGGGCAC
19AH       GTGGATGGGACGCCTCTTCCGTGTTGAGGGAAAAGGGATTTCGTTCAGTGATTGCTGGGCAC
23FPO      GTGGATGGTACACCGCTGCCCTCTGGATGGTACAGGGATTTCGCTCAGTGATTGCTGGGCAC
19FTW      GTGGATGGTACACCGCTGCCCTCTGGATGGTACAGGGATTTCGCTCAGTGATTGCTGGGCAC
9VSP       GTGGATGGTACACCGCTGCCCTCTGGATGGTACAGGGATTTCGCTCAGTGATTGCTGGGCAC
TIGR4      GTGGATGGTACACCGCTGCCCTCTGGATGGTACAGGGATTTCGCTCAGTGATTGCTGGGCAC
23FTW      GTGGATGGGACGCCTCTTCCGTGTTGAGGGAAAAGGGATTTCGTTCAGTGATTGCTGGGCAC
*****

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670        CGTGCAGAACCAAGCCATGTCTTTTTCCGCCATTTGGATCAGCTAAAAGTTGGAGATGCT
6BF        CGTGCAGAACCAAGCCATGTCTTTTTCCGCCATTTGGATCAGCTAAAAGTTGGAGATGCT
6BSP       CGTGCAGAACCAAGCCATGTCTTTTTCCGCCATTTGGATCAGCTAAAAGTTGGAGATGCT
19AH       CGTGCAGAACCAAGCCATGTCTTTTTCCGCCATTTGGATCAGCTAAAAGTTGGAGATGCT
23FPO      CGTGCAGAGCCAAGCCATGTCTTTTTCCGCCATTTGGATCAGCTAAAAGTTGGAGATGCT
19FTW      CGTGCAGAGCCAAGCCATGTCTTTTTCCGCCATTTGGATCAGCTAAAAGTTGGAGATGCT
9VSP       CGTGCAGAGCCAAGCCATGTCTTTTTCCGCCATTTGGATCAGCTAAAAGTTGGAGATGCT
TIGR4      CGTGCAGAGCCAAGCCATGTCTTTTTCCGCCATTTGGATCAGCTAAAAGTTGGAGATGCT
23FTW      CGTGCAGAACCAAGCCATGTCTTTTTCCGCCATTTGGATCAGCTAAAAGTTGGAGATGCT
*****
```

Figure 196AK

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14CSR CTTTATTATGATAATGGCCAGGAAATTGTAGAATATCAGATGATGGACACAGAGATTATT  
670 CTTTATTATGATAATGGCCAGGAAATTGTAGAATATCAGATGATGGACACAGAGATTATT  
6BF CTTTATTATGATAATGGCCAGGAAATTGTAGAATATCAGATGATGGACACAGAGATTATT  
6BSP CTTTATTATGATAATGGCCAGGAAATTGTAGAATATCAGATGATGGACACAGAGATTATT  
19AH CTTTATTATGATAATGGCCAGGAAATTGTAGAATATCAGATGATGGACACAGAGATTATT  
23FPO CTTTATTATGATAATGGCCAGGAAATTGTAGAATATCAGATGATGGACACAGAGATTATT  
19FTW CTTTATTATGATAATGGCCAGGAAATTGTAGAATATCAGATGATGGACACAGAGATTATT  
9VSP CTTTATTATGATAATGGCCAGGAAATTGTAGAATATCAGATGATGGACACAGAGATTATT  
TIGR4 CTTTATTATGATAATGGCCAGGAAATTGTAGAATATCAGATGATGGACACAGAGATTATT  
23FTW CTTTATTATGATAATGGCCAGGAAATTGTAGAATATCAGATGATGGACACAGAGATTATT  
\*\*\*\*\*

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670 TTACCGTCGGAATGGGAAAAATTAGAATCGGTTAGCTCTAAAAATATCATGACCTTGATA  
6BF TTACCGTCGGAATGGGAAAAATTAGAATCGGTTAGCTCTAAAAATATCATGACCTTGATA  
6BSP TTACCGTCGGAATGGGAAAAATTAGAATCGGTTAGCTCTAAAAATATCATGACCTTGATA  
19AH TTACCGTCGGAATGGGAAAAATTAGAATCGGTTAGCTCTAAAAATATCATGACCTTGATA  
23FPO TTACCGTCGGAATGGGAAAAATTAGAATCGGTTAGCTCTAAAAATATCATGACCTTGATA  
19FTW TTACCGTCGGAATGGGAAAAATTAGAATCGGTTAGCTCTAAAAATATCATGACCTTGATA  
9VSP TTACCGTCGGAATGGGAAAAATTAGAATCGGTTAGCTCTAAAAATATCATGACCTTGATA  
TIGR4 TTACCGTCGGAATGGGAAAAATTAGAATCGGTTAGCTCTAAAAATATCATGACCTTGATA  
23FTW TTACCGTCGGAATGGGAAAAATTAGAATCGGTTAGCTCTAAAAATATCATGACCTTGATA  
\*\*\*\*\*

14CSR ACCTGCGATCCGATTCCCTACCTTTAATAAACGCTTATTAGTGAATTTTGAACGAGTCGCT  
670 ACCTGCGATCCGATTCCCTACCTTTAATAAACGCTTATTAGTGAATTTTGAACGAGTCGCT  
6BF ACCTGCGATCCGATTCCCTACCTTTAATAAACGCTTATTAGTGAATTTTGAACGAGTCGCT  
6BSP ACCTGCGATCCGATTCCCTACCTTTAATAAACGCTTATTAGTGAATTTTGAACGAGTCGCT  
19AH ACCTGCGATCCGATTCCCTACCTTTAATAAACGCTTATTAGTGAATTTTGAACGAGTCGCT  
23FPO ACCTGCGATCCGATTCCCTACCTTTAATAAACGCTTATTAGTGAATTTTGAACGAGTCGCT  
19FTW ACCTGCGATCCGATTCCCTACCTTTAATAAACGCTTATTAGTGAATTTTGAACGAGTCGCT  
9VSP ACCTGCGATCCGATTCCCTACCTTTAATAAACGCTTATTAGTGAATTTTGAACGAGTCGCT  
TIGR4 ACCTGCGATCCGATTCCCTACCTTTAATAAACGCTTATTAGTGAATTTTGAACGAGTCGCT  
23FTW ACCTGCGATCCGATTCCCTACCTTTAATAAACGCTTATTAGTGAATTTTGAACGAGTCGCT  
\*\*\*\*\*

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670 GTTTATCAAAAATCAGATCCACAAACAGCTGCAGTTGCGAGGGTTGCTTTTACGAAAGAA  
6BF GTTTATCAAAAATCAGATCCACAAACAGCTGCAGTTGCGAGGGTTGCTTTTACGAAAGAA  
6BSP GTTTATCAAAAATCAGATCCACAAACAGCTGCAGTTGCGAGGGTTGCTTTTACGAAAGAA  
19AH GTTTATCAAAAATCAGATCCACAAACAGCTGCAGTTGCGAGGGTTGCTTTTACGAAAGAA  
23FPO GTTTATCAAAAATCAGATCCACAAACAGCTGCAGTTGCGAGGGTTGCTTTTACGAAAGAA  
19FTW GTTTATCAAAAATCAGATCCACAAACAGCTGCAGTTGCGAGGGTTGCTTTTACGAAAGAA  
9VSP GTTTATCAAAAATCAGATCCACAAACAGCTGCAGTTGCGAGGGTTGCTTTTACGAAAGAA  
TIGR4 GTTTATCAAAAATCAGATCCACAAACAGCTGCAGTTGCGAGGGTTGCTTTTACGAAAGAA  
23FTW GTTTATCAAAAATCAGATCCACAAACAGCTGCAGTTGCGAGGGTTGCTTTTACGAAAGAA  
\*\*\*\*\*

14CSR GGACAATCTGTATCGCGTGTGCAACCTCTCAATGGTTGTACCGTGGGCTAGTGGTACTG  
670 GGACAATCTGTATCGCGTGTGCAACCTCTCAATGGTTGTACCGTGGGCTAGTGGTACTG  
6BF GGACAATCTGTATCGCGTGTGCAACCTCTCAATGGTTGTACCGTGGGCTAGTGGTACTG  
6BSP GGACAATCTGTATCGCGTGTGCAACCTCTCAATGGTTGTACCGTGGGCTAGTGGTACTG  
19AH GGACAATCTGTATCGCGTGTGCAACCTCTCAATGGTTGTACCGTGGGCTAGTGGTACTG  
23FPO GGACAATCTGTATCGCGTGTGCAACCTCTCAATGGTTGTACCGTGGGCTAGTGGTACTG  
19FTW GGACAATCTGTATCGCGTGTGCAACCTCTCAATGGTTGTACCGTGGGCTAGTGGTACTG  
9VSP GGACAATCTGTATCGCGTGTGCAACCTCTCAATGGTTGTACCGTGGGCTAGTGGTACTG  
TIGR4 GGACAATCTGTATCGCGTGTGCAACCTCTCAATGGTTGTACCGTGGGCTAGTGGTACTG  
23FTW GGACAATCTGTATCGCGTGTGCAACCTCTCAATGGTTGTACCGTGGGCTAGTGGTACTG  
\*\*\*\*\*

Figure 196AL

PCT/US05/27239

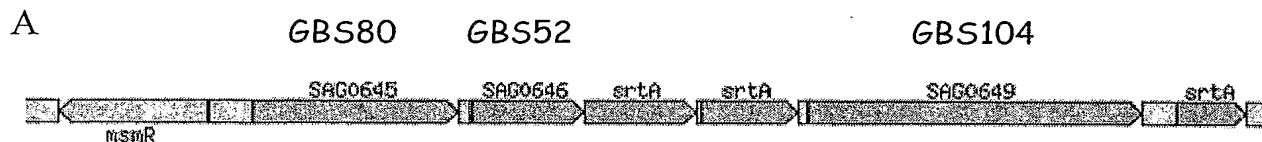
431/487

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6BF        GCATTTCTGGGAATCCTGTTTGTGTTTGTGGAAGCTAGCACGTTTACTACGAGGGAAATAA
6BSP       GCATTTCTGGGAATCCTGTTTGTGTTTGTGGAAGCTAGCACGTTTACTACGAGGGAAATAA
19AH       GCATTTATGGGAATCCTGTTTGTGTTTGTGGAAGCTAGCACGTTTACTACGAGGGAAATAA
23FPO      GCATTTCTGGGAATCCTGTTTGTGTTTGTGGAAGCTAGCACGTTTACTACGAGGGAAATAA
19FTW      GCATTTCTGGGAATCCTGTTTGTGTTTGTGGAAGCTAGCACGTTTACTACGAGGGAAATAA
9VSP       GCATTTCTGGGAATCCTGTTTGTGTTTGTGGAAGCTAGCACGTTTACTACGAGGGAAATAA
TIGR4      GCATTTCTGGGAATCCTGTTTGTGTTTGTGGAAGCTAGCACGTTTACTACGAGGGAAATAA
23FTW      GCATTTCTGGGAATCCTGTTTGTGTTTGTGGAAGCTAGCACGTTTACTACGAGGGAAATAA
          *****

14CSR      AAAGAAATGAAAGGAAAGCTAAGGCTGTTCCTTTTCCGGCTCTTTGTCAACTGTAGGGG
670        AAAGAAATGAAAGGAAAGCTAAGGCTGTTCCTTTTCCGGCTCTTTGTCAACTGTAGTGG
6BF        AAAGAAATGAAAGGAAAGCTAAGGCTGTTCCTTTTCCGGCTCTTTGTCAACTGTAG---
6BSP       AAAGAAATGAAAGGAAAGCTAAGGCTGTTCCTTTTCCGGCTCTTTGTCAACTGTAG---
19AH       AAAGAAATGAAAGGAAAGCTAAGGCTGTTCCTTTTCCGGCTCTTTGTCAACTGTAG---
23FPO      AAAGAAATGAAAGGAAAGCTAAGGCTGTTCCTTTTCCGGCTCTTTGTCAACTGT-----
19FTW      AAAGAAATGAAAGGAAAGCTAAGGCTGTTCCTTTTCCGGCTCTTTGTCAACTGTAGT--
9VSP       AAAGAAATGAAAGGAAAGCTAAGGCTGTTCCTTTTCCGGCTCTTTGTCAACTGTAG---
TIGR4      AAAGAAATGAAAGGAAAGCTAAGGCTGTTCCTTTTCCGGCTCTTTGTCAACTGTAGTGG
23FTW      AAAGAAATGAAAGGAAAGCTAAGGCTGTTCCTTTTCCGGCTCTTTGTCAACTGTAGT---
          *****
```

Figure 196AM

Figure 197



B

### Intergenic region between AraC R and GBS 80

#### AraC...CAT

TTGATAGAC**CCGCCTTC**ATTATCATTTCTAGAATTTTTCTTTAGGTTTGTA  
 AAGACTACAAAATAAAATGATGAAAACAACATCTTGTGGATACACTAAA  
 AAGACACGCTAATTAGCAAACCTCTCTTCATCATCTCTCACCATTATTA  
 TACTAC **TATTTATAT**GACAAATAAAGGT**GATTT** **TGTTAA**AATATAACTTT  
 GAAAATCCACATATATTTTTTAATCTTCCGTCTG**AAAAAA**TAAATAAAAAT  
 AGTAAAAATAAACACGAATTTAAAATAAGCAAATTTTTTAAGAAAATCTG  
 TGCTAAACTTTAATAGTTTTGTGCTTAATAATAATCAGCACTTACAAAGA  
 ACAAAGGGAAAAGCGAG**GAGAGA**ACTTTTA **ATG... GBS80**

C

187	4A		5A		5A
233	6A		6A		7A
Strain	FACS α -80	Strain	FACS α -80	Strain	FACS α -80
1998	95	5364	<b>454</b>	2129	57
2110	0	JMV071	<b>556</b>	2274	113
2603	62	JM91003	<b>587</b>	5401	170
3050	43	CJB111	<b>365</b>	5408	0
5376	165			5518	31
M781	65			CJB110	71
COH1	<b>305</b> (G→T 179)			J7357B	91
18rs 21	0 (STOP, no LPXTG)			COH31	0

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AI-1											
			aa	M1	M3	M5	M18	M49	M6	M12	
M6											
50913503	M6_Spy0157	LPXTG	628	gas15 30%in593aa	M3-0098 46%in256aa M3-0104 28%in563aa		M18-0132 24%in701aa			M12-4134 74%in703aa	Fibronecti n-binding protein (protein F)
50913505	M6_Spy0159	LPXSG	1037		M3-0104 25%in339aa					M12-4141 37%in98aa	Collagen adhesion protein
50913506	M6_Spy0160	LPXTG	557								Fimbrial structural subunit

Figure 198

AI-2									
		aa	M1	M3	M5	M18	M49	M6	M12
M1									
gas15	gas15	VXGTG	762	M3-0098 50%in738aa	M5-orf78 60%in462aa	M18-0126 54%in469aa			M12-4135 54%in747aa
13621428	SPy0128 gas16	EVXTG	340	M3-0100 40%in354aa	M5-orf80 41%in358aa	M18-0128 38%in357aa			M12-4137 40%in354aa
13621430	SPy0130 gas18	LPXTG	215	M3-0102 32%200aa	M5-orf82 31%in213aa	M18-0130 32%in213aa			M12-4139 31%in206aa
									hypothetical protein (fimbrial)
									hypothetical protein

Figure 199

AI-3										
			aa	M1	M3	M5	M18	M49	M6	M12
M3										
21909634	SpyM3_0098	VPXTG	744	gas15 51%in739aa		M5-orf78 58%in484aa	M18-0126 74%in482aa			M12-4135 55%in751aa
21909636	SpyM3_0100	QVXTG	344	gas16 40%in354aa		M5-orf80 64%in349aa	M18-0128 67%in345aa			M12-4137 61%in344aa
21909638	SpyM3_0102	LPXAG	195	gas18 32%in200aa		M5-orf82 98%in183aa	M18-0130 97%in183aa			M12-4139 99%in183aa
21909640	SpyM3_0104	LPXTG	696			M5-orf84 88%in656aa	M18-0132 88%in656aa			M12-4141 59%in612aa
										putative collagen binding protein (Cpb)
										conserved hypothetic al protein (fimbrial)
										hypothetic al protein
										protein F2 like fibronectin -binding

Figure 200A

Figure 200B

Figure 200B



Figure 200C

Figure 200C

M49												
56808848	VPXTG	744	gas15 55%in738aa	M3-0098 72%in743aa	M5-orf78 78%in483	M18-0126 61% in484				M12-4135 73%in752aa	putative collagen binding protein (Cpb)	
56808846	QVXTG	344	gas16 36%in355aa	M3-0100 66%in345aa	M5-orf80 61%in349aa	M18-0128 90%in344aa				M12-4137 62%in344aa	conserved hypothetic al protein (fimbrial)	
56808844	LPXAG	189	gas18 31%in206aa	M3-102 98%in189aa	M5-orf82 98%in189aa	M18-0130 98%in189aa				M12-4139 98%in189aa	hypothetic al protein	
56808842	LPXTG	1160		M3-104 59%in612aa	M5-orf84 50%in701aa	M18-0132 50%in701aa			M6-0157 32%in296aa	M12-4141 91%in1164aa	protein F2 like fibronectin -binding	

Figure 200D

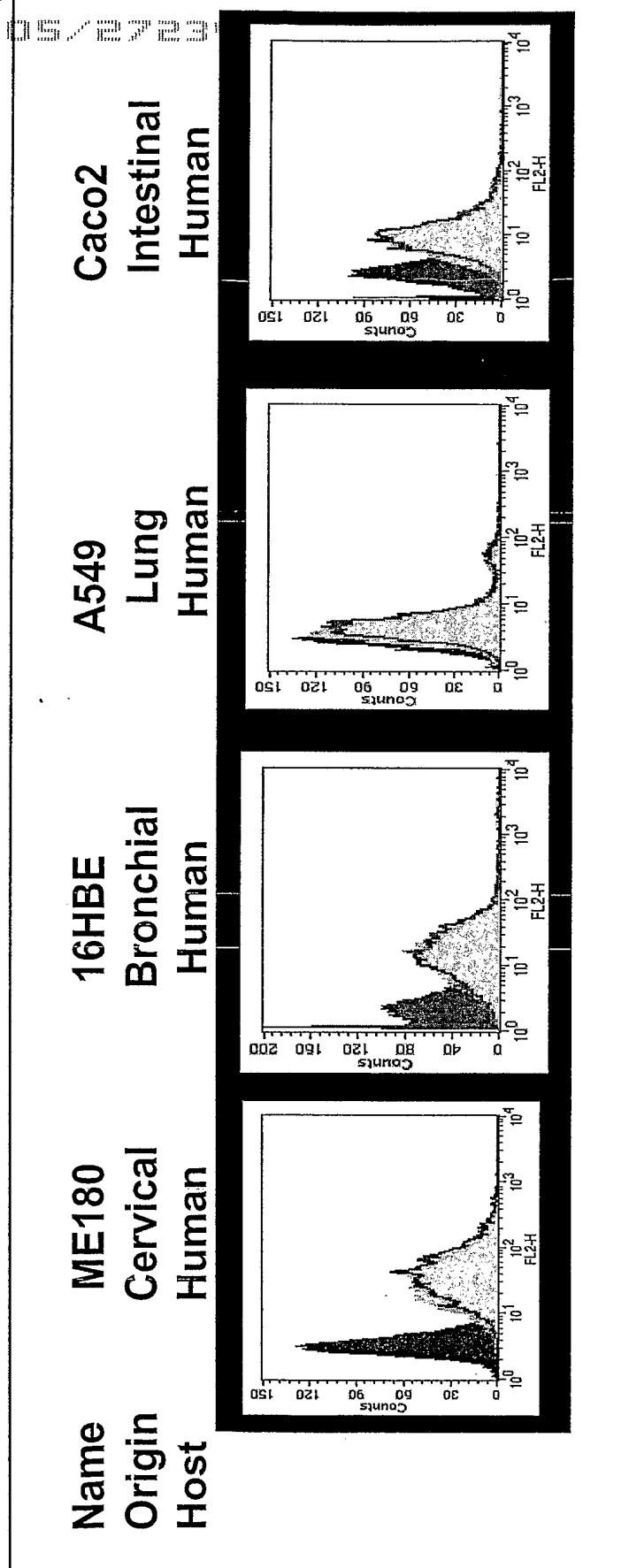
439/487

AI-4										
		aa	M1	M3	M5	M18	M49	M6	M12	
<b>M12</b>										
19224134	LPXTG	698	gas15 44%in297aa	M3-0098 49%in254aa				M6-0157 74%in703aa		protein F
19224135	VPXTG	756	gas15 54%in747aa	M3-0098 55%in751aa	orf78 80%in484aa	M18-0126 59%in483aa		M6-0157 51%in275aa		Cpa
19224137	QVXTG	342	gas16 40%in354aa	M3-0100 61%in344aa	orf80 65%in384aa	M18-0128 62%in344aa				EflSLA (fimbrial)
19224139	LPXAG	189	gas18 31%in206aa	M3-0102 99%in183aa	orf82 98%in189aa	M18-130 97%in189aa				Orf2
19224141	LPXTG	1161		M3-0104 59%in612aa	orf84 50%in701aa	M18-0132 50%in701aa				protein F2

Figure 201

Figure 202

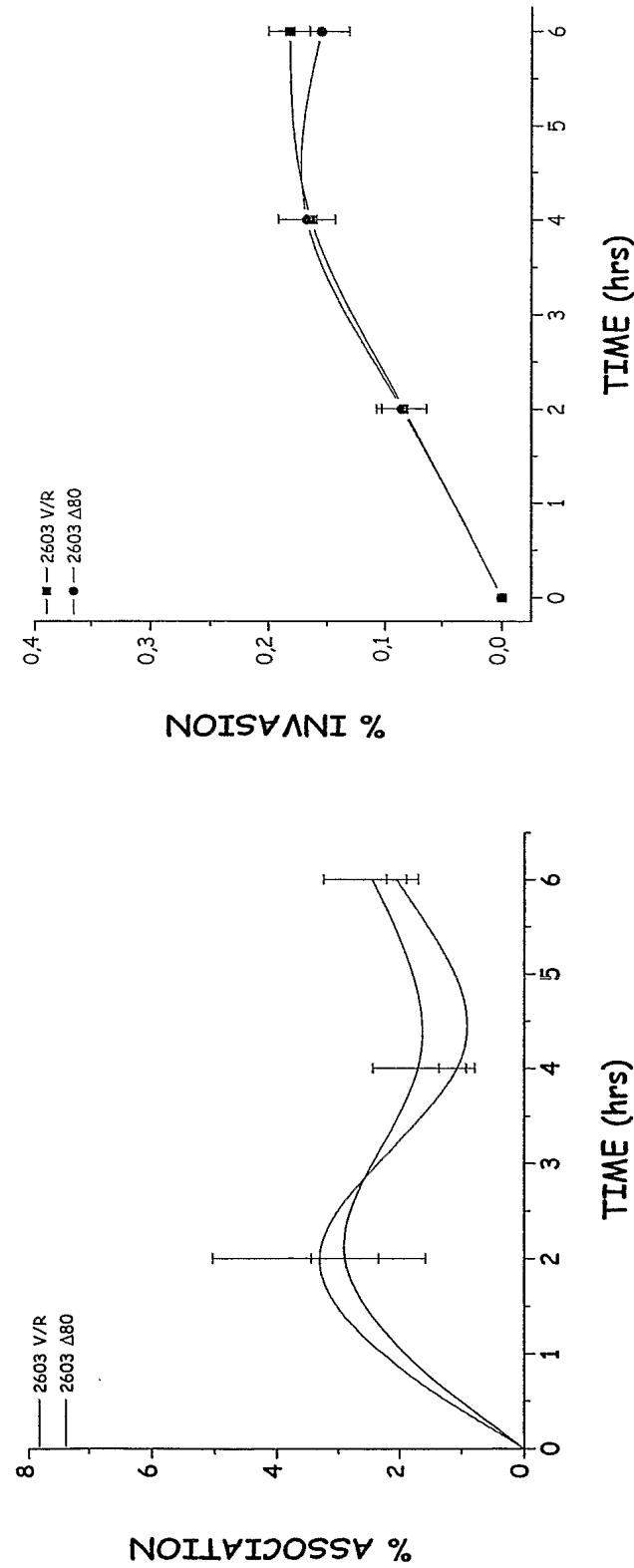
# GBS80 recombinant protein does not bind to epithelial cells



Epithelial cells were incubated in the presence or absence of GBS80 protein and then a mouse a-GBS80 polyclonal antibody added. The cell were then stained with FITC-conjugated a-mouse IgG antibody. The violet area indicates cells treated with FITC-conjugated antibody alone. GBS80 binding, expressed as Dmean channel values, was measured by FACSscan cytometer as difference in fluorescence intensity between cell incubated with or without GBS80. The same protocol was used for GBS101 protein binding to epithelial cells

Figure 203

# Deletion of GBS80 protein does not affect the ability of GBS to adhere and invade ME180



ME180 cervical carcinoma epithelial cells were infected with GBS 2603 wild type or 2603 D80 isogenic mutant. After 2h infection, non-adherent bacteria were washed off and infection prolonged for further 2h and 4h. In invasion experiments, after each time point followed a 2h antibiotic treatment. Cells were then lysed with 1% saponin and lysates plated on TSA plates.

Figure 204

# GBS80 binds to ECM proteins

ELISA with purified ECM components and native GBS80 protein

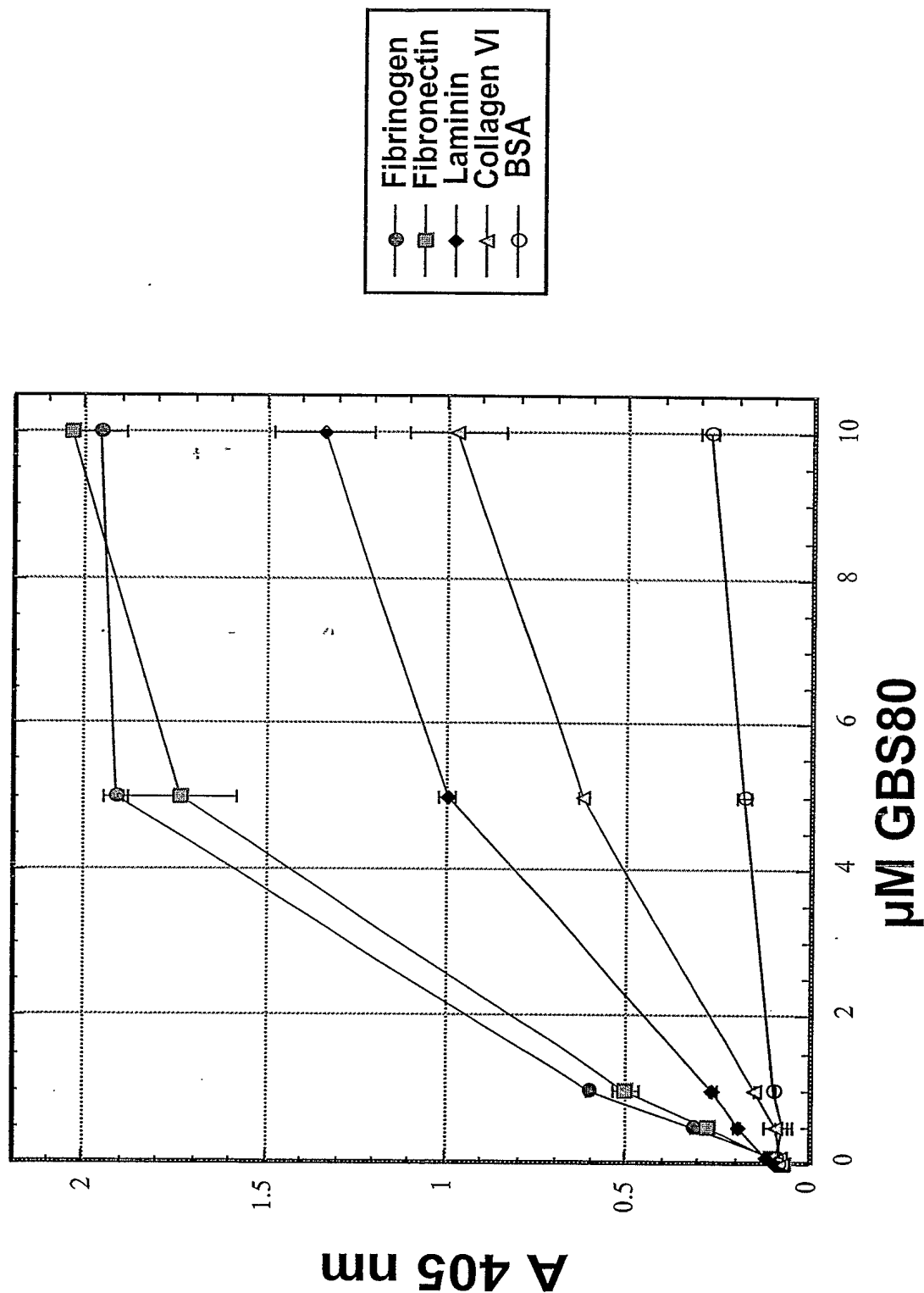
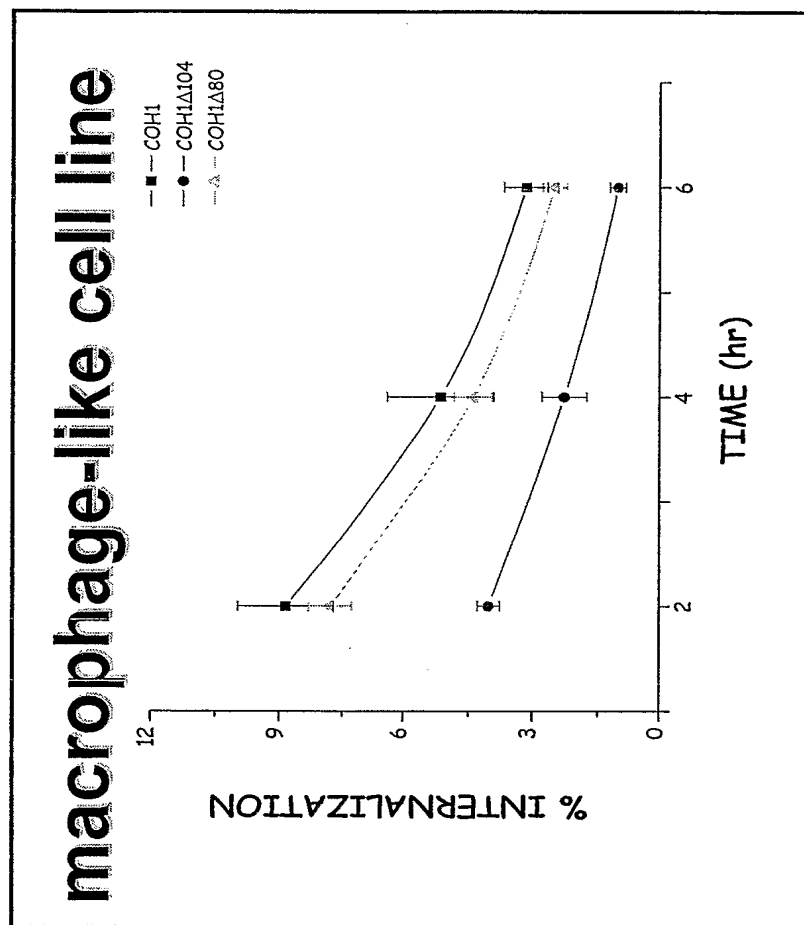


Figure 205

# Deletion of GBS104 protein, but not GBS80, reduces the capacity of GBS to invade J774



J774 cells were infected with GBS COH1 wild type or COH1ΔGBS104/COH1ΔGBS80 isogenic mutants. After 1h infection, non-adherent bacteria were washed off and intracellular bacteria recovered at 2h, 4h and 6h post-antibiotic treatment. At each time point cells were lysed with 0.25% Triton X-100 and

Figure 206

**GBS104 knockout mutant strain translocates  
through an epithelial monolayer less efficiently than  
the isogenic wild type**

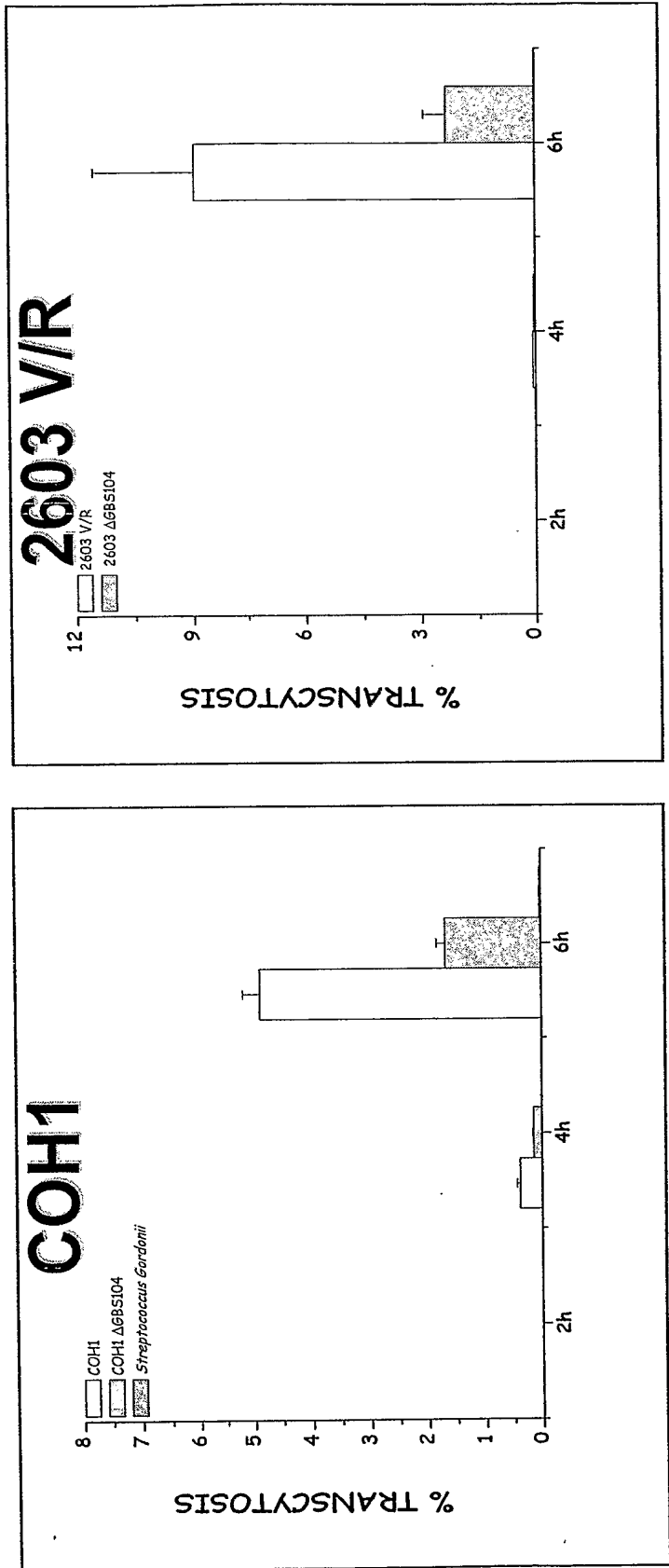
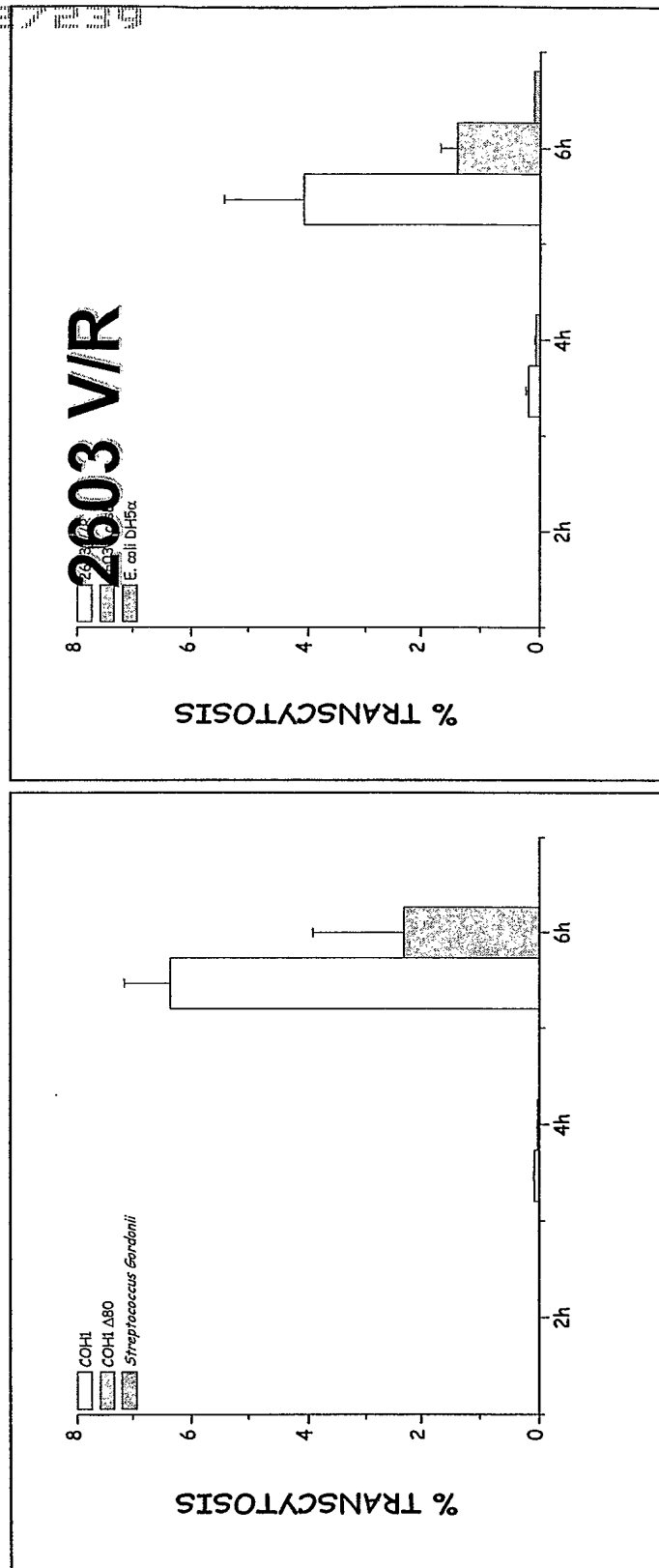




Figure 207

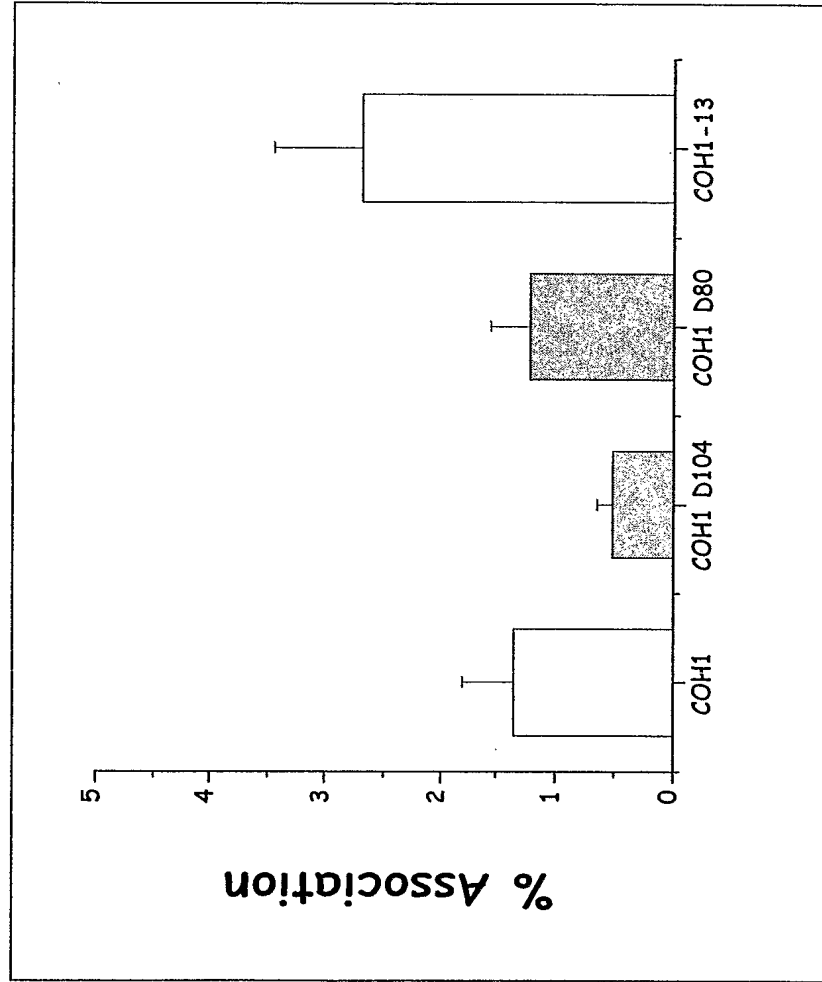
# GBS80 knockout mutant strain partially loses the ability to translocate through an epithelial monolayer



Epithelial cells monolayers were inoculated with each bacterium in the apical chamber of a transwell system for 2h and then non-adherent bacteria washed off. Infection was prolonged for further 2h and 4h. Samples were taken from the media of the basolateral side and the number of colony forming units measured. Transepithelial electrical resistance measured prior and after infection gave comparable values, indicating the maintenance of the integrity of the monolayer.

Figure 208

## GBS adherence to HUVEC endothelial cells



HUVEC cells were infected with GBS COH1 wild type or COH1DGBS104/COH1DGBS80 isogenic mutants. After 1h infection, non-adherent bacteria were washed off and cells lysed with 1% saponin and lysates plated on TSA plates.

# COH1 strain growth rate

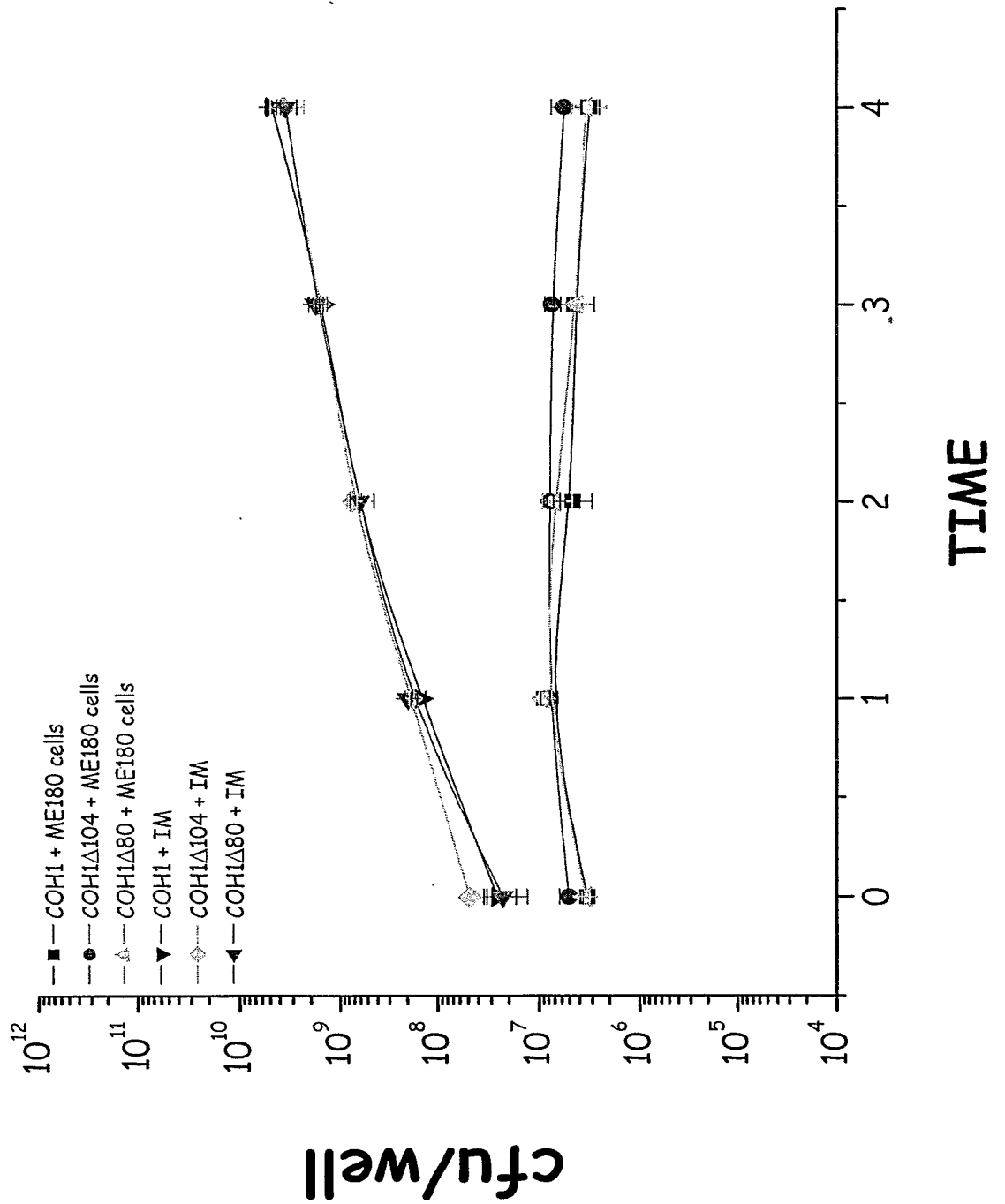


Figure 210

# Binding of recombinant GBS104 protein to epithelial cells

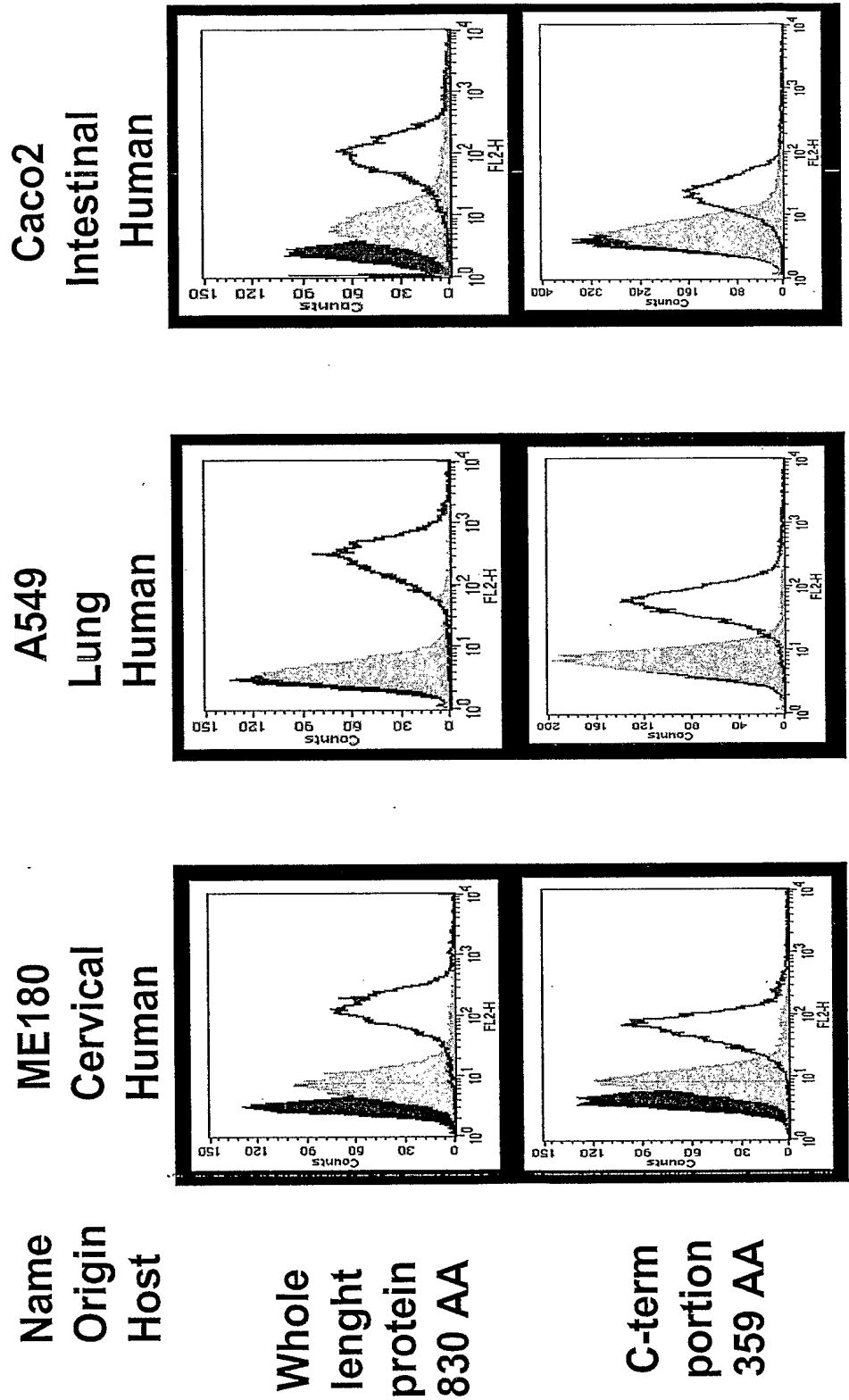
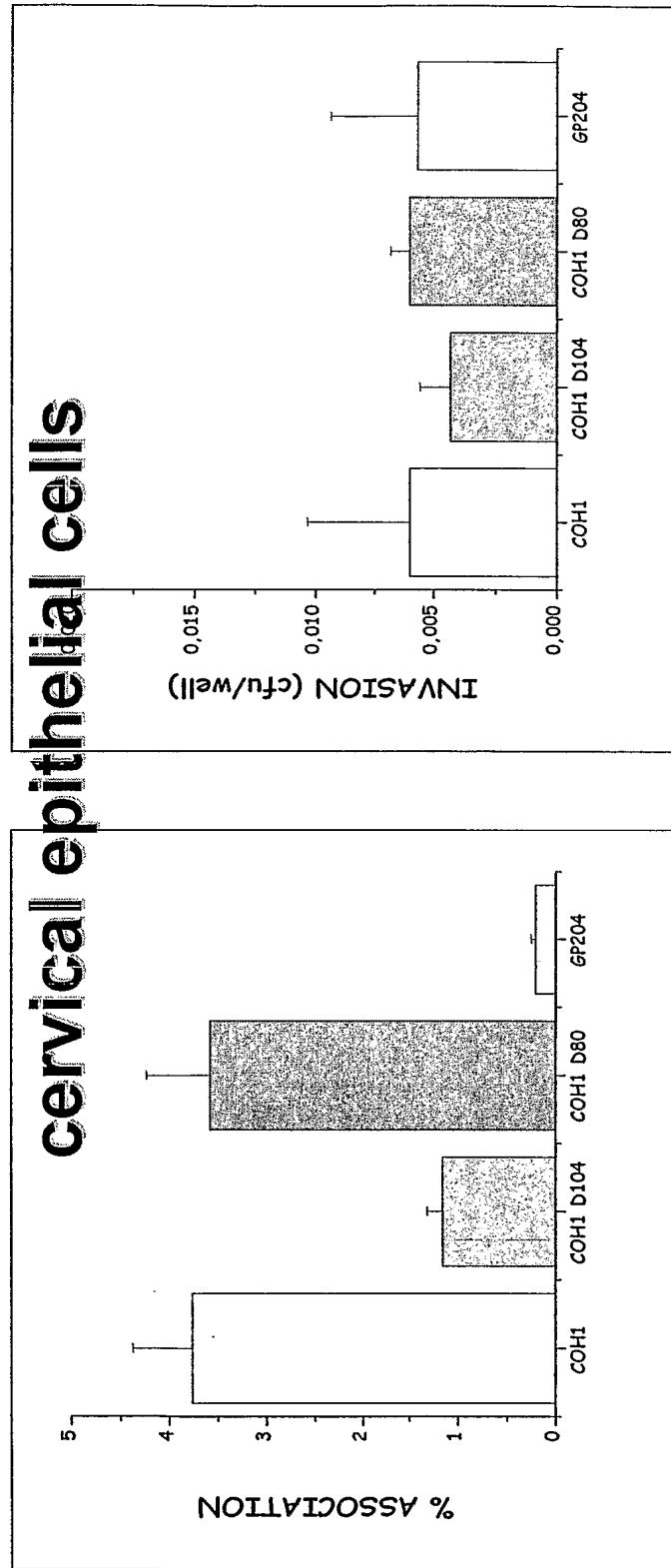


Figure 211

# Deletion of GBS104 protein in the GBS strain COH1 reduces the ability of GBS to adhere to ME180



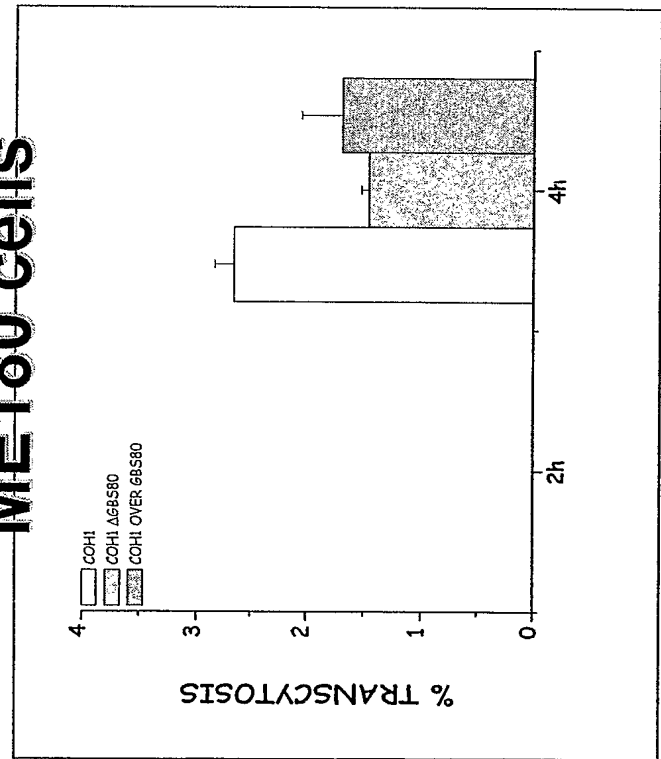
ME180 cervical carcinoma epithelial cells were infected with GBS COH1 wild type or COH1DGBS104/ COH1DGBS80 isogenic mutants. After 1h infection, non-adherent bacteria were washed off and cells lysed with 1% saponin and

lactates plated on TSA plates

Figure 212

# COH1 overexpressing GBS80 protein has an impaired capacity to translocate through an epithelial monolayer

## ME180 cells



## Caco2 cells

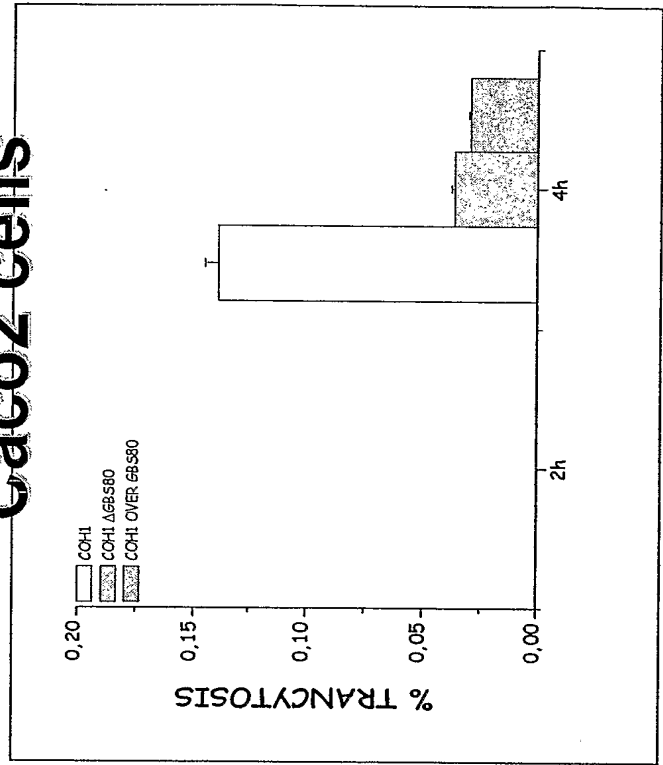


Figure 213

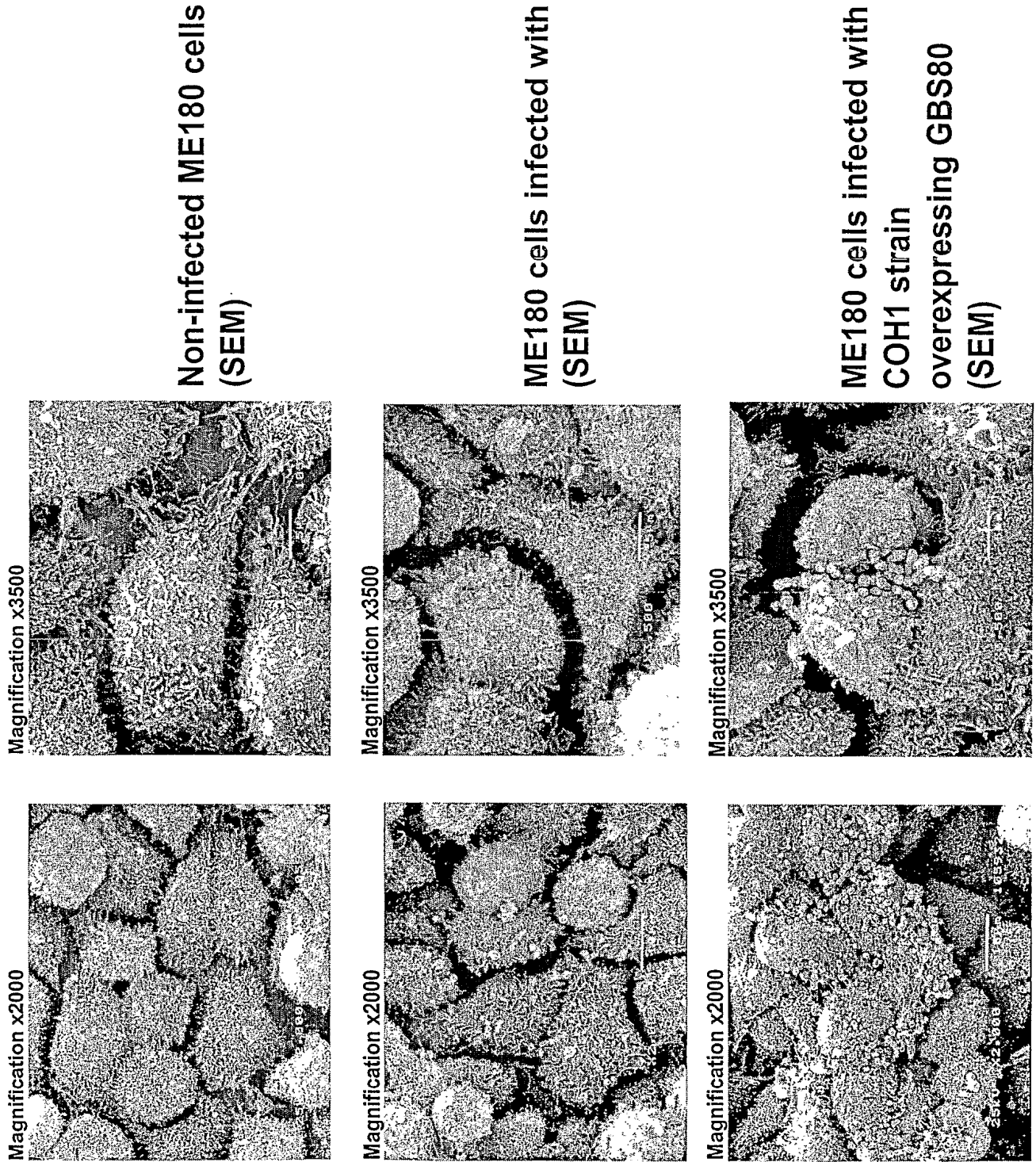


Figure 214

OH1 infection of ME180 cells

F-actin Blue

$\alpha$ -serotype III capsule Red

$\alpha$ -GBS80 Green

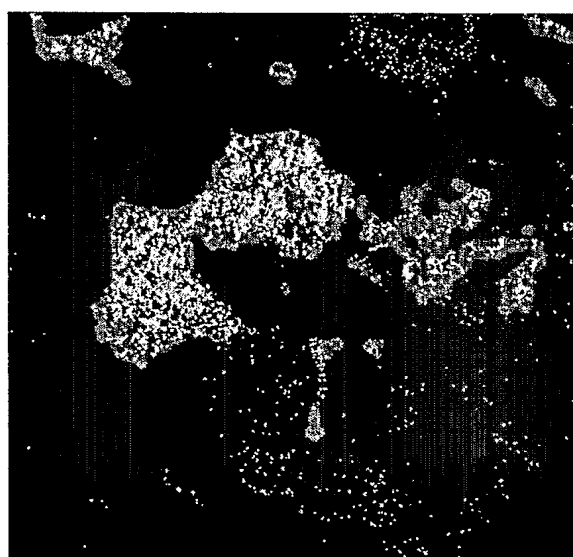
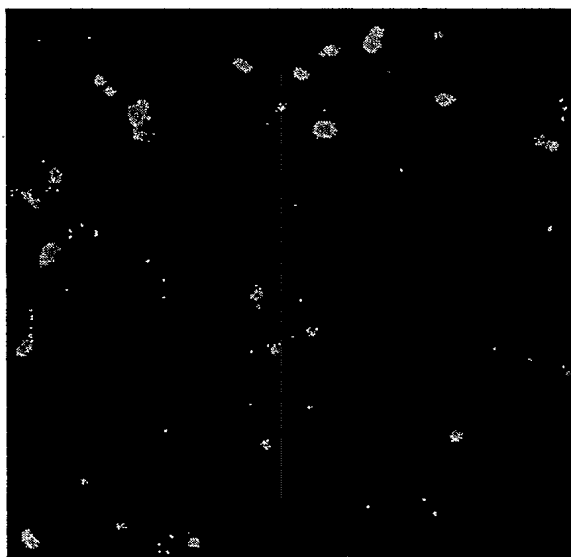
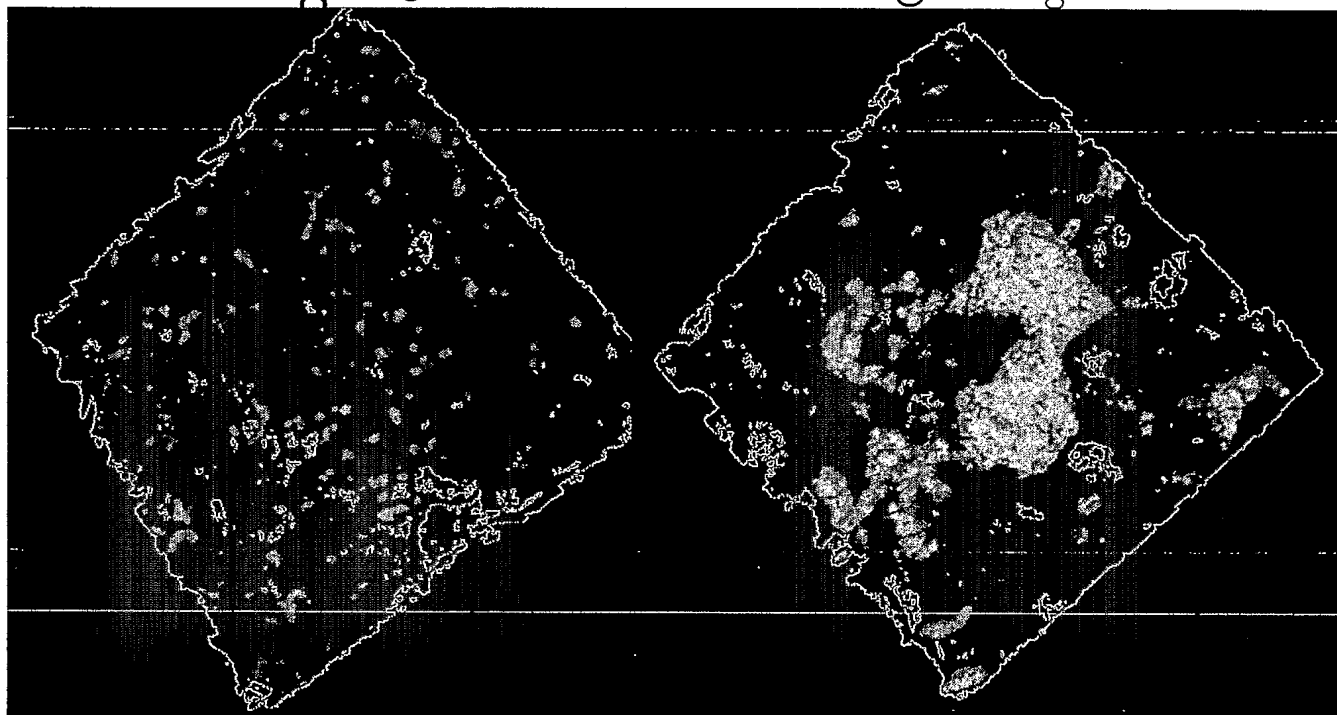
OH1 overexpressing GBS80

infection of ME180 cells

F-actin Blue

$\alpha$ -serotype III capsule Red

$\alpha$ -GBS80 Green

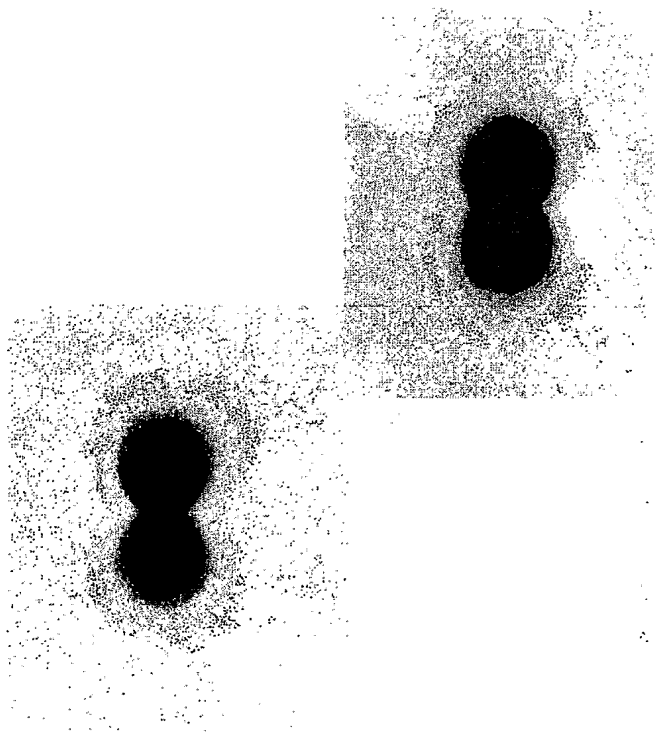




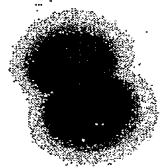
453/487

Figure 215

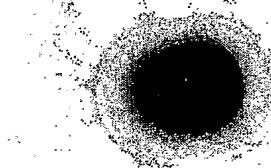
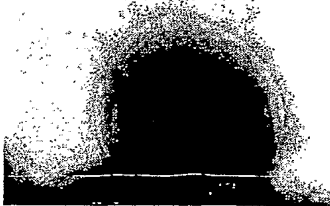
515 WT



515 Δ59



515 Δ59p59



α59

α59

Figure 216

WO 2006/078318

PCT/US2005/027239

454/487

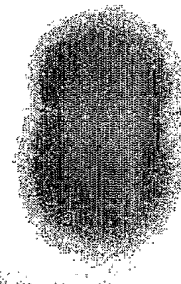
PCT/US2005/027239

515  $\Delta$ 67p67

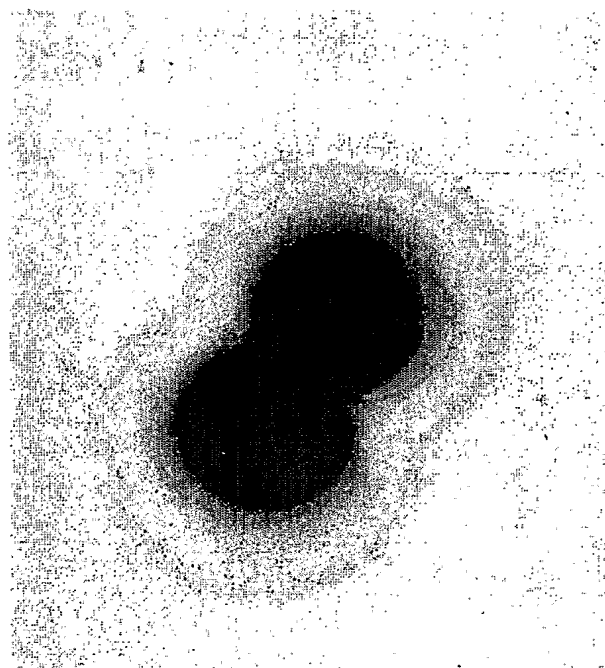


$\alpha$ 67

515  $\Delta$ 67

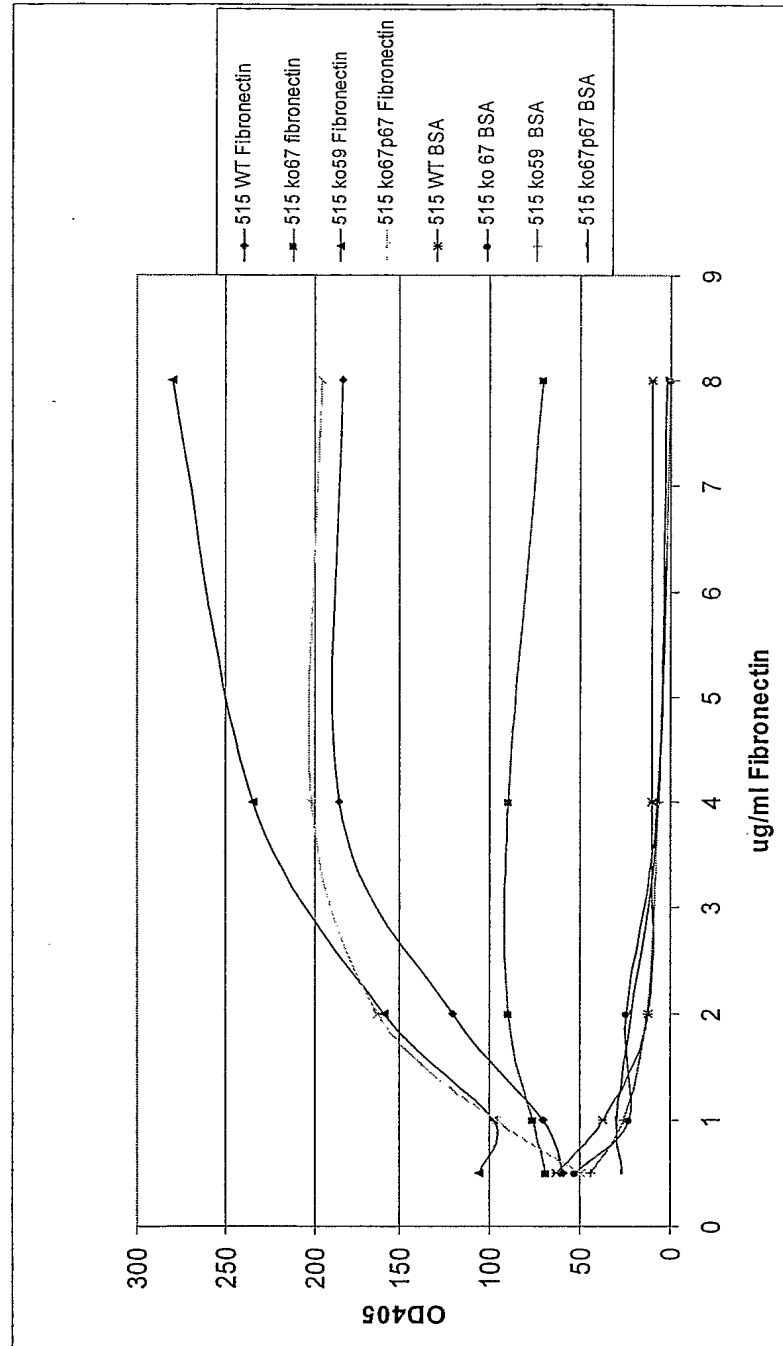


515 WT



$\alpha$ 67

**Figure 217**  
**GBS 67 binds to fibronectin**



## Figure 218

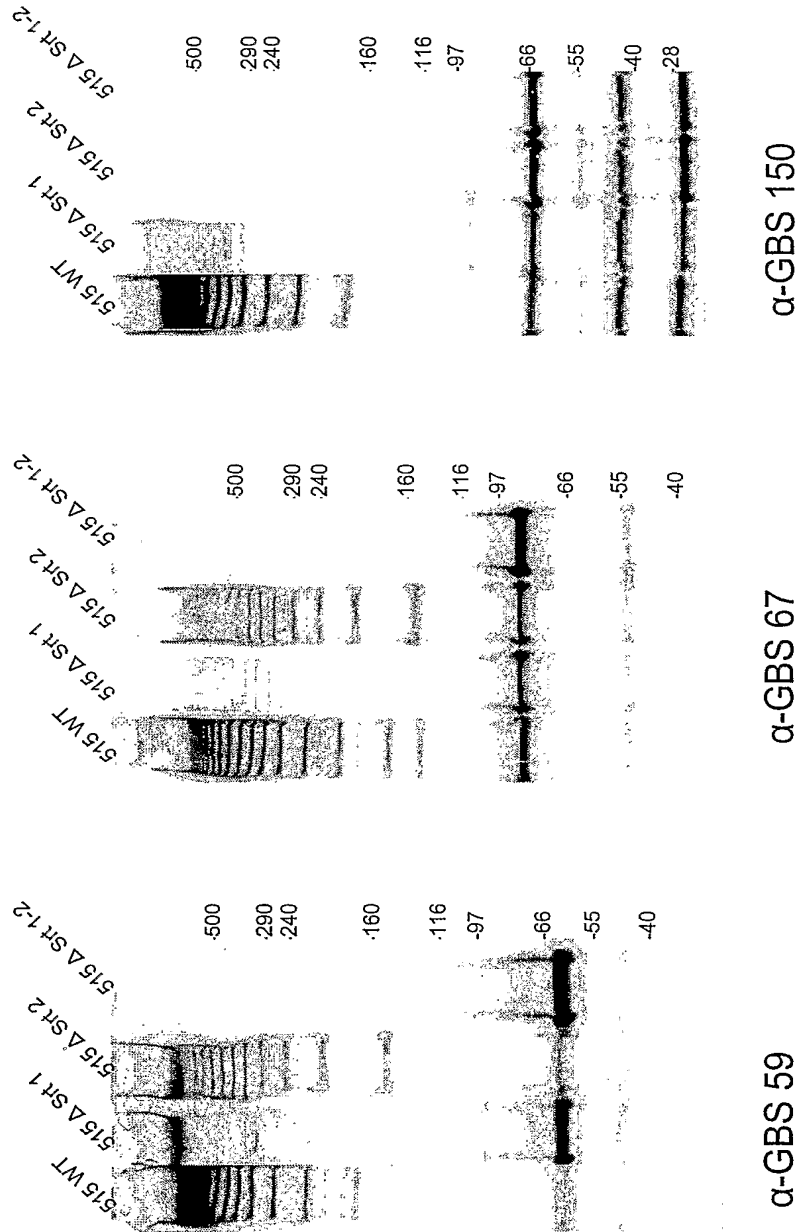
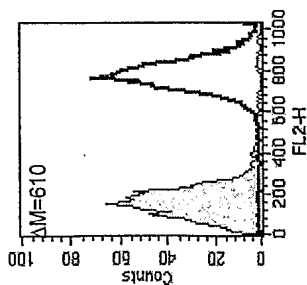
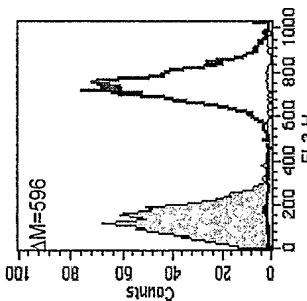


Figure 219

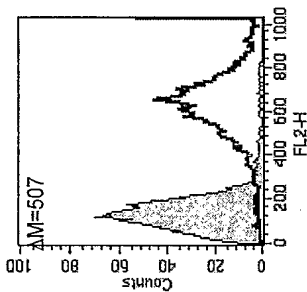
515 WT



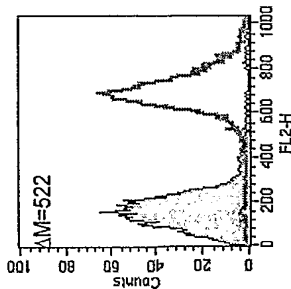
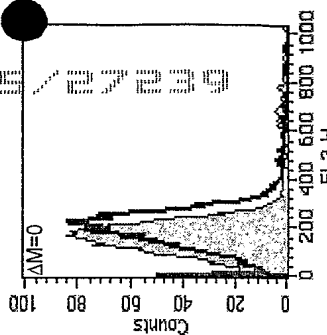
515 Δ Srt 1



515 Δ Srt 2



515 Δ Srt 1.2



α67

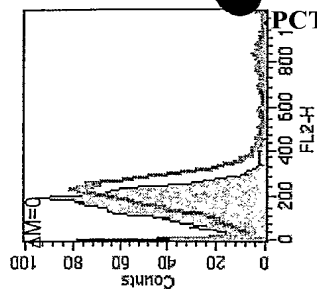
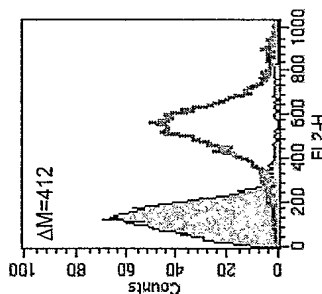
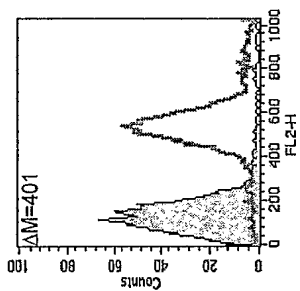
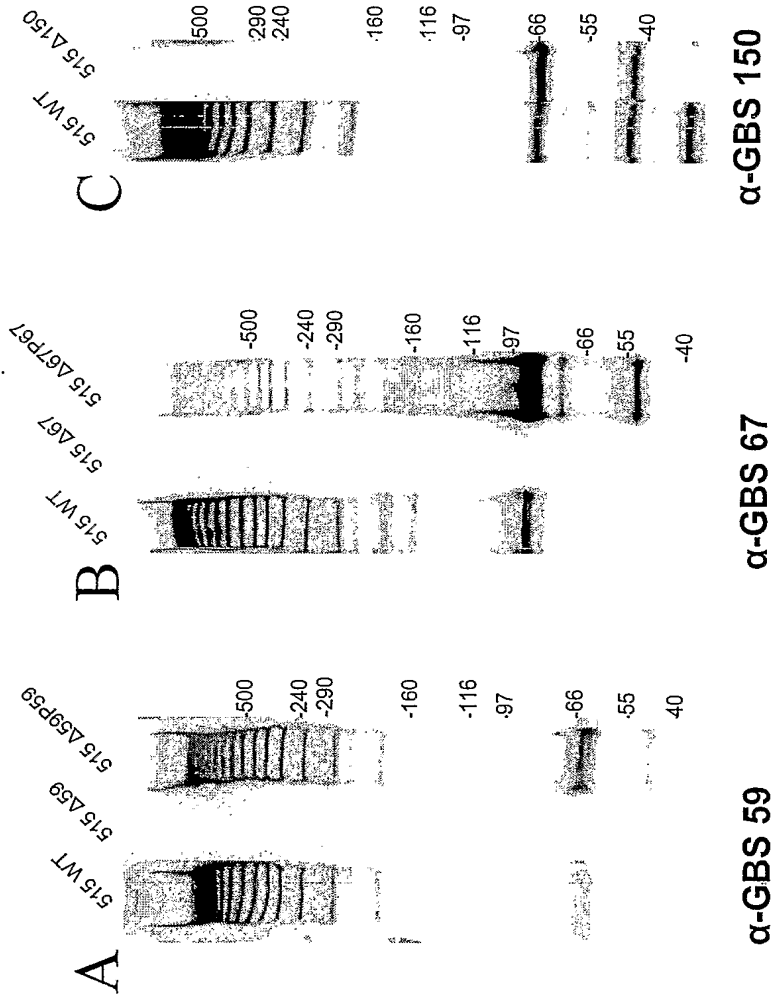
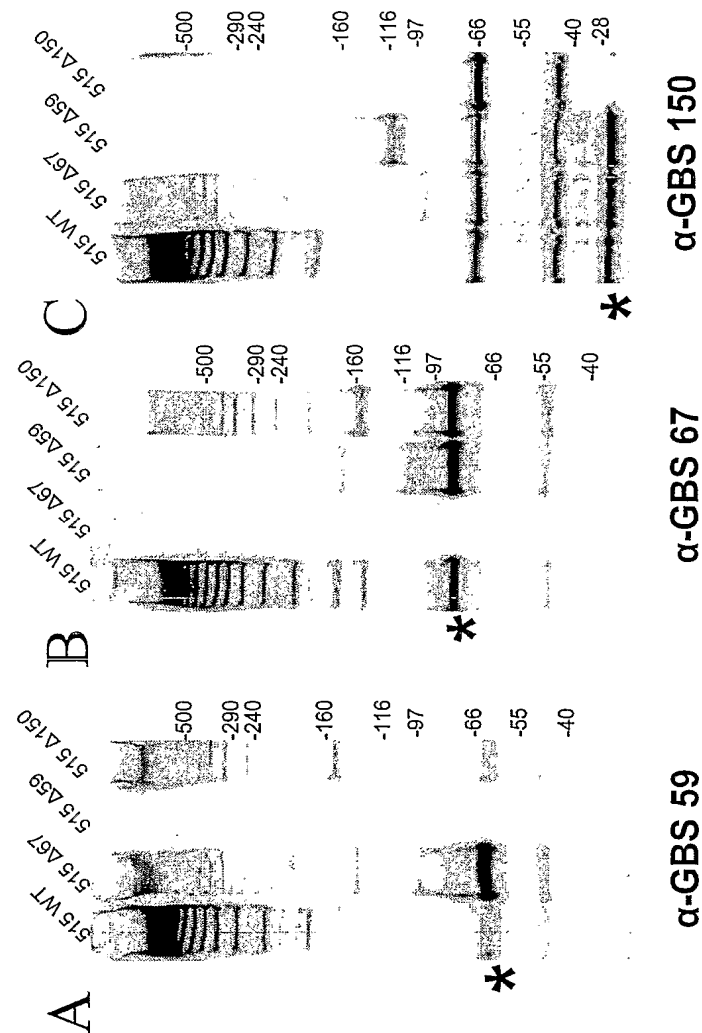


Figure 220



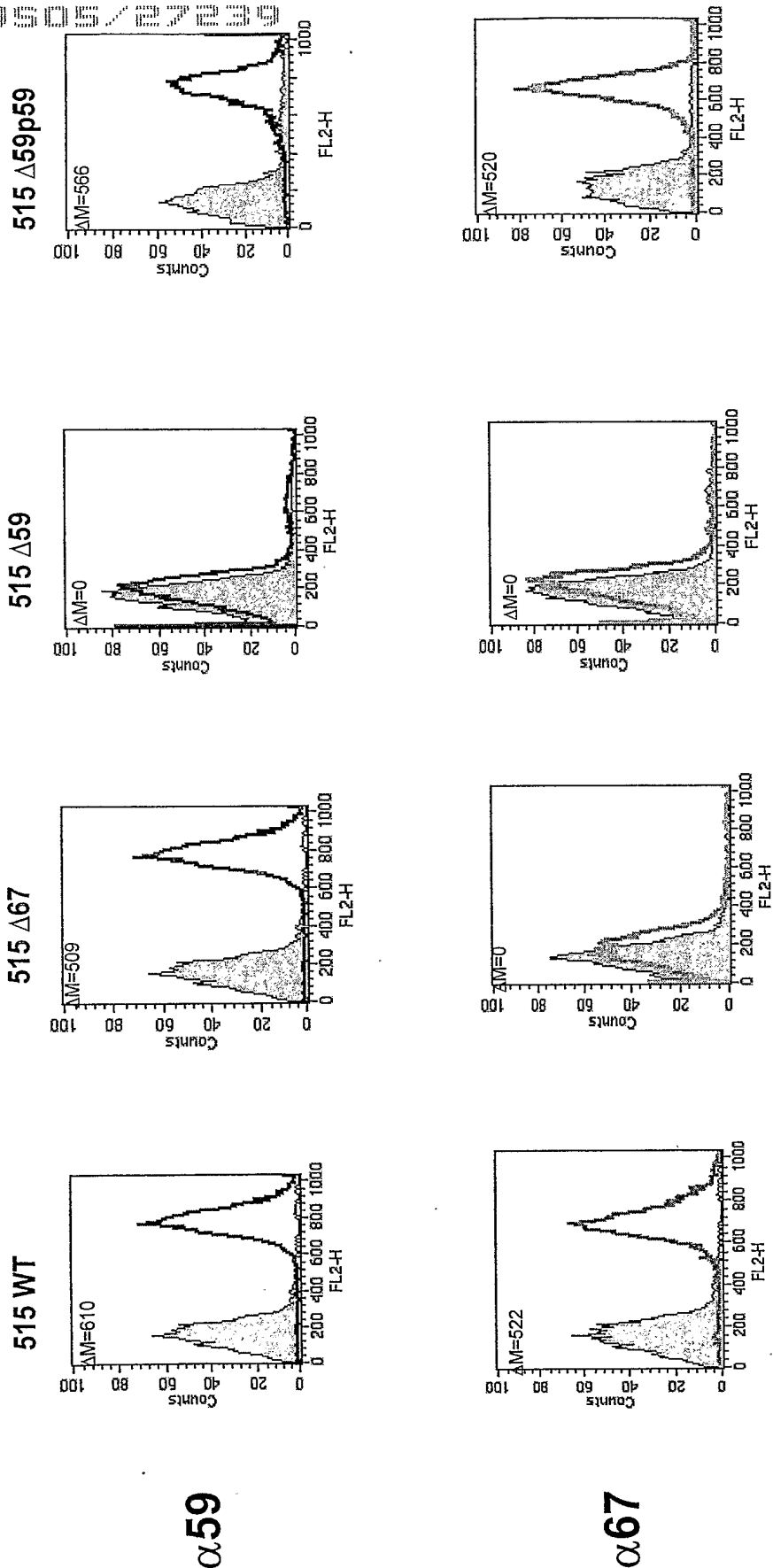
PCT/US05/27239 459/487

Figure 221



PCT/US05/27239

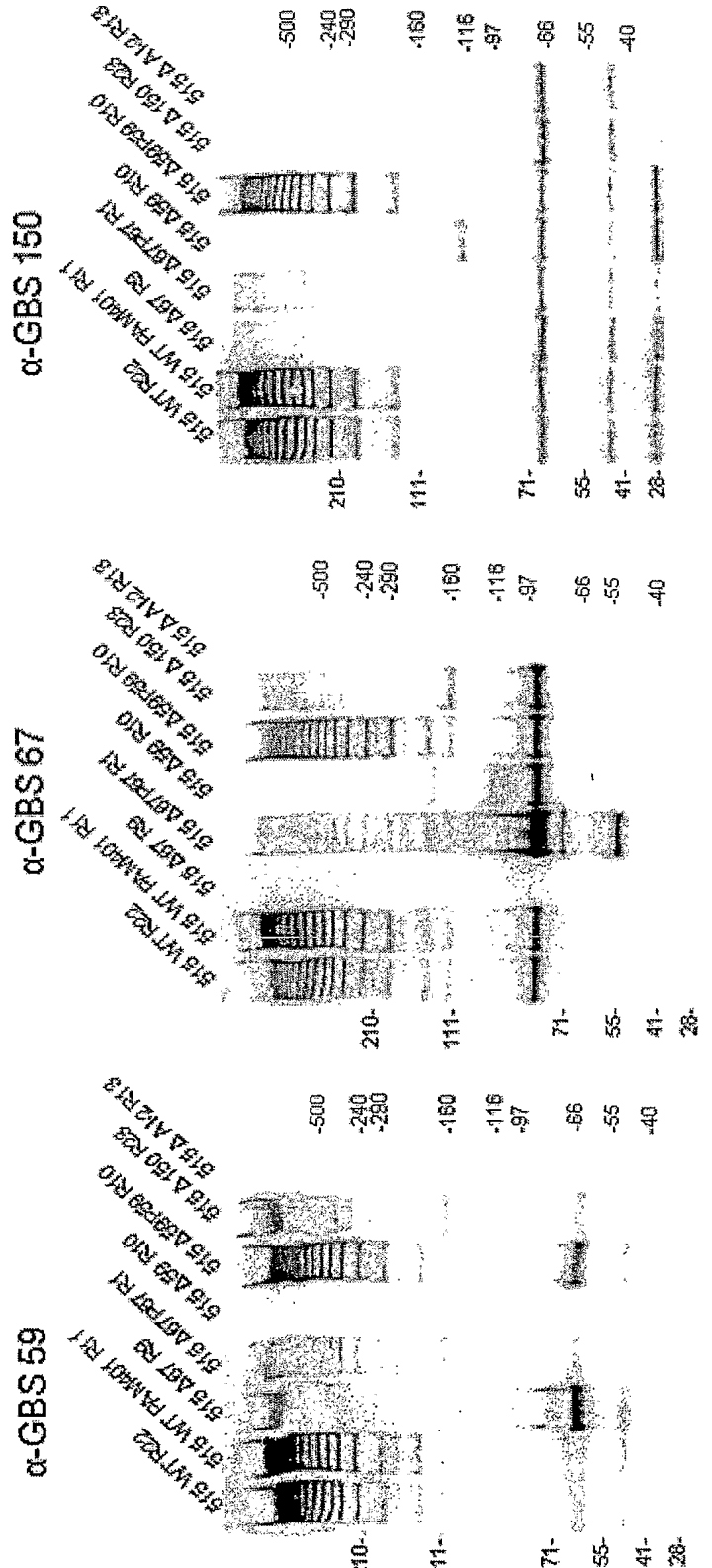
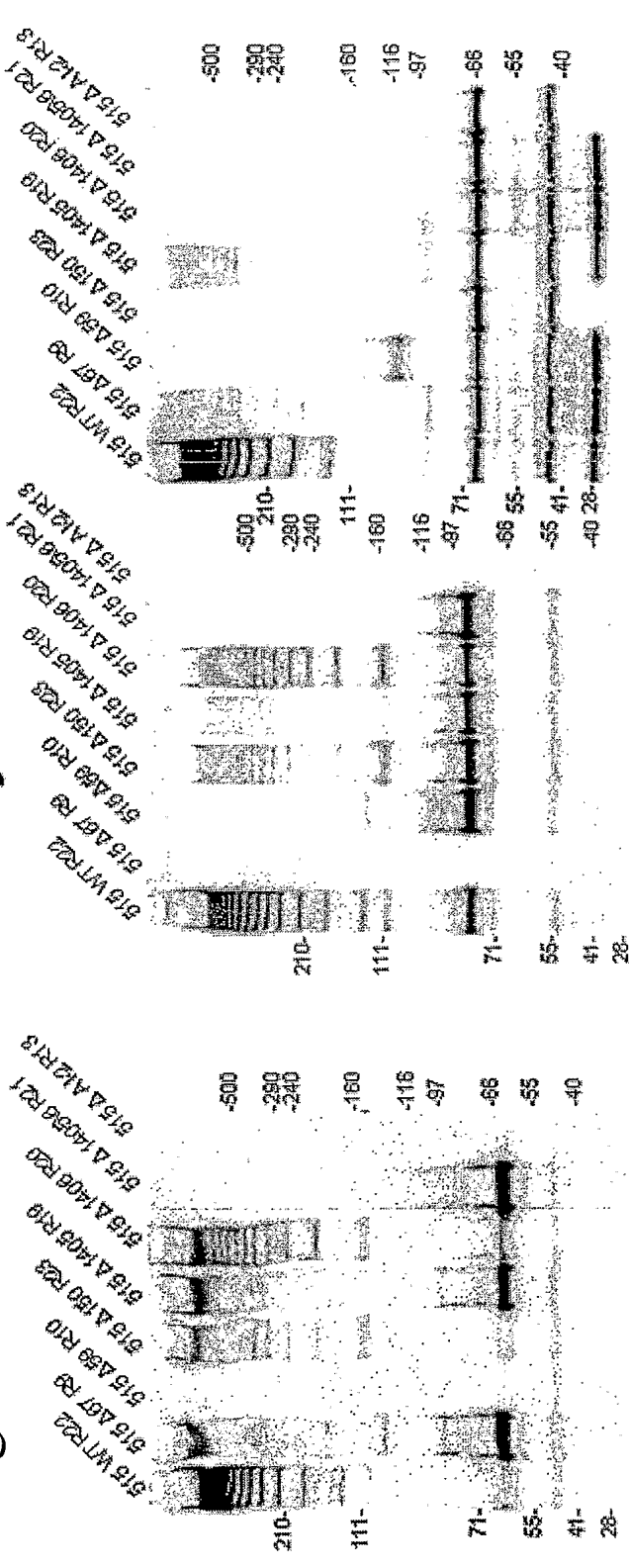
Figure 222





# Summary WB

Figure 223



GBS strain % AA identity

7357b (Ib)	100
5518 (Ib)	100
5364 (V)	100
1999 (IV)	100
5408 (VIII)	98
coh31 (III)	98
d136c (III)	98
nem316 (III)	98

dk1 (Ia)	100
dk8 (Ia)	100
davis (Ia)	100
5551 (Ia)	100
2986 (Ia)	100
2110 (V)	100
2210 (IV)	100

18RS21 (II)	100
3050 (II)	100
2141 (II)	100
1998 (III)	100
2928 (VII)	99,9

2274 (IV)	99,9
2129 (Ib)	99,7
5401 (II)	99,8

# GBS 59 allelic variants

cjb111 (V)  
674 aa

515 (Ia)  
675 aa

2603 (V)  
705 aa

H36b (Ib)  
693 aa

75%

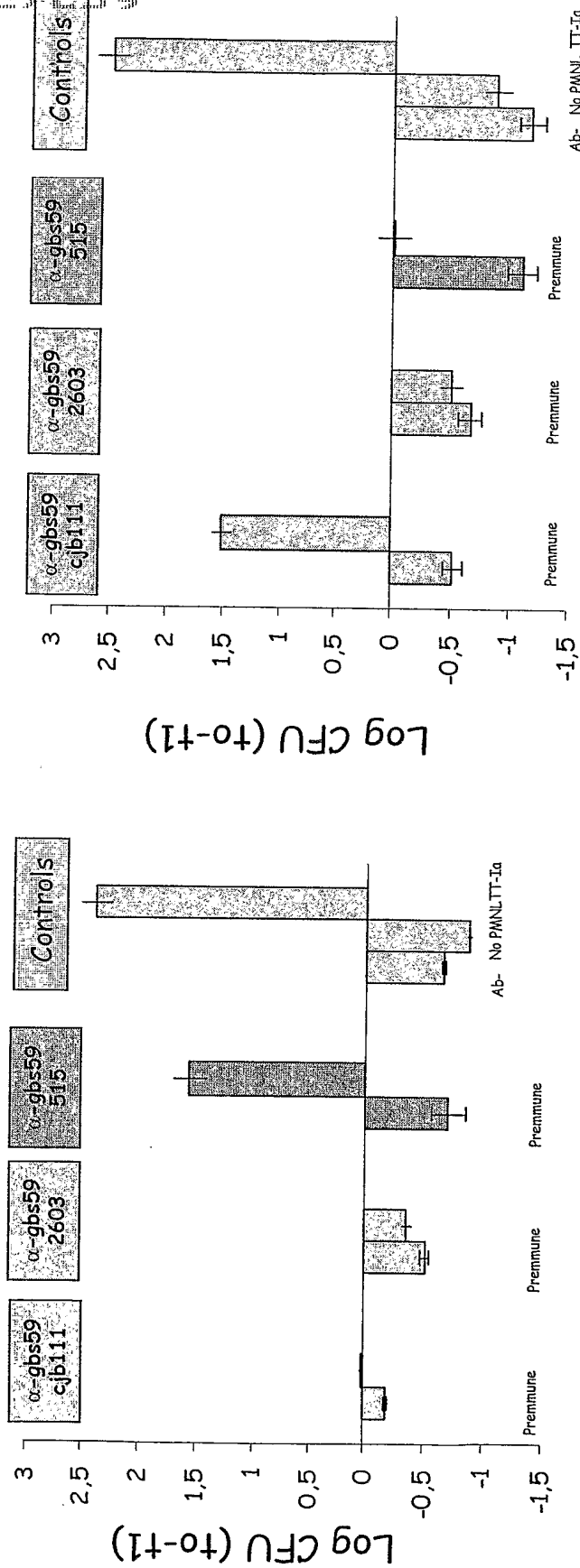
48%

65%

Figure 224

Figure 225

GBS 59 is opsonic only against homologous strain



• 515 (Ia) GBS strain

• cjb111 (V) GBS strain

Figure 226 A

		GBS 59		
GBS strains	Type	PCR	FACS (a-cjb111)	FACS (a-2603)
DK1	Ia	+	565	
DK8		+	559	
Davis		+	577	
515		+	583	0
090		+	0	0
2986		+	443	
5551		+	524	
H36B	Ib	+	0	410
7357b-		+	596	
5518		+	190	
D136C	III	+	504	
COH31		+	505	
1998		+	59	510
18RS21	II	+	0	353
DK21		+	249	0
3050		+	0	570
5401		+	0	400
2141		+	0	371
CJB111	V	+	625	0
2603		+	0	73
5364		+	593	
2110		+	590	0
2274	IV	+	0	400
1999		+	594	
2210		+	636	
5408	VIII	+	537	
CJB110	NT	+	0	0
1169		+	227	0

		GBS 59		
GBS strains	Type	PCR	FACS (a-cjb111)	FACS (a-2603)
A909	Ia	-	22	0
2177	Ib	-	75	
COH1	III	-	0	
M732		-	0	
M781		-	17	
5376		-	60	
5435		-	55	
SMU071	VIII	-	0	0
JM9130013		-	0	

Figure 226 B

Figure 227 A

		FACS (D Mean)				
GBS strains	Type	GBS 80	GBS 104	GBS 67	GBS 322	GBS 59
DK1	Ia	0	0	478	153	565
DK8		0	0	475	213	559
Davis		0	0	430	86	577
515		0	0	409	227	583
090		0	0	0	0	0
A909		46	29	0	0	0
2986		0	0	397	0	443
5551		0	0	485	36	524
2177	Ib	477	355	66	323	0
H36B		0	0	444	105	410
7357b-		91	0	316	102	596
5518		31	0	162	0	190
COH1	III	305	226	0	130	0
D136C		40	40	406	460	504
COH31		0	0	273	479	505
M732		141	101	0	292	0
M781		111	136	0	224	0
1998		140	77	350	288	510
5376		165	156	0	76	0
5435		93	100	0	88	0
18RS21	II	0	0	103	471	353
DK21		0	0	331	342	249
3050		71	46	460	188	570
5401		75	28	618	135	400
2141		0	0	370	76	371
CJB111	V	365	236	481	58	625
2603		62	0	105	293	73
5364		454	281	394	463	593

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2110		0	0	589	0	590
2274		123	62	484	161	400
1999	IV	0	389	453	55	594
2210		0	0	574	0	636
SMU071		556	393	74	170	0
JM9130013	VIII	587	436	72	133	0
5408		0	0	433	0	537
CJB110		0	0	245	587	0
1169	NT	0	0	443	213	227
D Mean > 200		6/37 (16%)	7/37 (19%)	24/37 (65%)	14/37 (38%)	24/37 (65%)

Figure 227B

Figure 228

		FACS (ΔMean)																Δmean
GBS Strain	Type	GBS 80		GBS 104		GBS 322		GBS 67		GBS 67		GBS 59		GBS 59		GBS 59		neg. control
		142-F		Mab		86		81		H36B		2603		CJB111		515		
cdc-1	II	114	95	0	0	122	122	360	341	422	403	92	73	254	235	306	287	19
cdc-2	IB	173	69	92	0	95	75	552	448	590	486	135	31	635	531	197	93	104
cdc-3	II	566	508	360	302	85	60	364	306	433	375	111	53	448	390	310	252	58
cdc-4	V	524	432	337	245	284	204	577	485	625	533	105	13	674	582	303	211	92
cdc-5	II	140	0	0	0	462	300	487	297	563	373	175	0	373	183	440	250	190
cdc-6	V	544	484	361	301	95	95	586	526	601	541	55	0	686	626	302	242	60
cdc-7	III	155	116	44	5	134	118	95	56	138	99	74	35	92	53	91	52	39
cdc-8	III	347	304	192	149	74	62	98	55	170	127	72	29	88	45	108	65	43
cdc-9	II	89	65	0	0	226	191	390	366	504	480	181	157	317	293	410	386	24
cdc-10	IA	46	24	0	0	152	152	494	472	531	509	43	21	16	0	48	26	22
cdc-11	IA	17	0	0	0	295	135	569	550	569	550	47	28	467	448	648	629	19
cdc-12	V	439	430	290	281	60	30	174	165	227	218	52	43	139	130	207	198	9
cdc-13	IA	33	0	0	0	216	146	469	436	469	436	100	67	361	328	571	538	33
cdc-14	III	78	68	10	0	213	191	50	40	85	75	38	28	69	59	67	57	10
cdc-15	III	119	53	24	0	108	98	48	0	127	61	89	23	105	39	100	34	66
cdc-16	V	363	335	177	149	310	270	70	42	127	99	48	20	130	102	128	100	28
cdc-17	III	160	0	163	0	408	248	377	217	410	250	441	281	359	199	167	7	160
cdc-18	III	49	28	0	0	239	218	34	13	36	15	16	0	49	28	56	35	21
cdc-19	III	182	101	0	0	361	280	310	229	312	231	384	303	220	139	0	0	81
cdc-20	V	348	304	203	159	380	336	166	122	211	167	114	70	232	188	128	84	44
cdc-21	II	222	132	83	0	150	60	331	241	336	246	0	0	420	330	59	0	90
cdc-22	IA	0	0	13	13	43	43	238	238	238	238	43	43	38	38	429	429	0
cdc-22 (9-6-05)		23	0	34	0	110	20	310	220	320	230	113	23	117	27	344	254	90
cdc-23	V	484	484	374	374	278	278	124	124	206	206	11	11	91	91	236	236	0
cdc-24	V	137	52	0	0	333	248	90	5	110	25	110	25	120	35	70	0	85
cdc-25	IA	0	0	0	0	351	190	530	370	565	405	495	335	442	282	625	465	160
cdc-26	II	117	2	0	0	185	70	210	95	285	170	30	0	175	60	210	95	115
cdc-27	III	323	95	34	0	498	270	346	118	406	178	424	196	314	86	64	0	228
cdc-28	V	150	92	20	0	132	74	462	404	505	447	0	0	526	468	78	20	58
cdc-29	IV	90	73	65	48	195	178	90	73	150	133	150	133	138	121	110	93	17
cdc-30	V	390	187	336	133	348	145	229	26	244	41	113	0	268	65	223	20	203
cdc-31	IA	22	0	68	0	306	182	368	244	386	262	126	2	248	124	426	302	124
cdc-32	IA	45	0	12	0	260	175	190	105	205	120	30	0	100	15	185	100	85
cdc-33	II	50	0	0	0	306	156	134	0	237	87	4	0	180	30	190	40	150
cdc-34	III	152	60	47	0	342	250	44	0	74	0	27	0	102	8	48	0	92
cdc-35	V	227	227	40	40	246	246	395	395	415	415	0	0	550	550	142	142	0
cdc-36	IB	25	15	8	0	30	20	154	144	174	164	33	23	222	212	20	10	10
cdc-37	III	168	53	61	0	361	246	82	0	133	18	83	0	132	17	75	0	115
cdc-38	II	140	14	30	0	338	212	124	0	198	72	158	32	138	12	104	0	126
cdc-39	II	126	0	0	0	316	148	466	298	514	346	438	270	184	16	34	0	168
cdc-40	V	420	366	214	160	22	0	103	49	162	108	90	36	209	155	192	138	54
cdc-41	II	146	31	15	0	380	265	330	215	425	310	140	25	280	165	315	200	115



Figure 229

# Expected strain coverage

MIX GBS proteins

n. antigens FACS++	vaccine options					w/o 322			w/o 104+322			w/o 59+322		
	80+104+67+59+322	80+104+67+322	80+104+67+59	80+104+67+59	80+104+67+322	80+104+67+59	80+104+67+322	80+104+67+59	80+104+67+322	80+104+67+59	80+104+67+322	80+104+67+59	80+104+67+322	80+104+67+59
1	89%	89%	89%	80%	80%	80%	80%	80%	79%	79%	79%	79%	79%	74%
2	74%	74%	51%	71%	71%	71%	71%	64%	24%	24%	24%	16%	16%	16%
3	23%	23%	14%	17%	17%	17%	17%	16%	13%	13%	13%	13%	13%	16%

- GBS 322 but not GBS 59 is important to increase strain coverage
- GBS 59 probably could be useful to increase the vaccine strength

## Assumption:

- Protein antigens that are highly accessible to antibodies confer 100% protection with suitable adjuvants

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Figure 230

GBS 59 opsonophagocytic activity is comparable to that of the four-protein mix

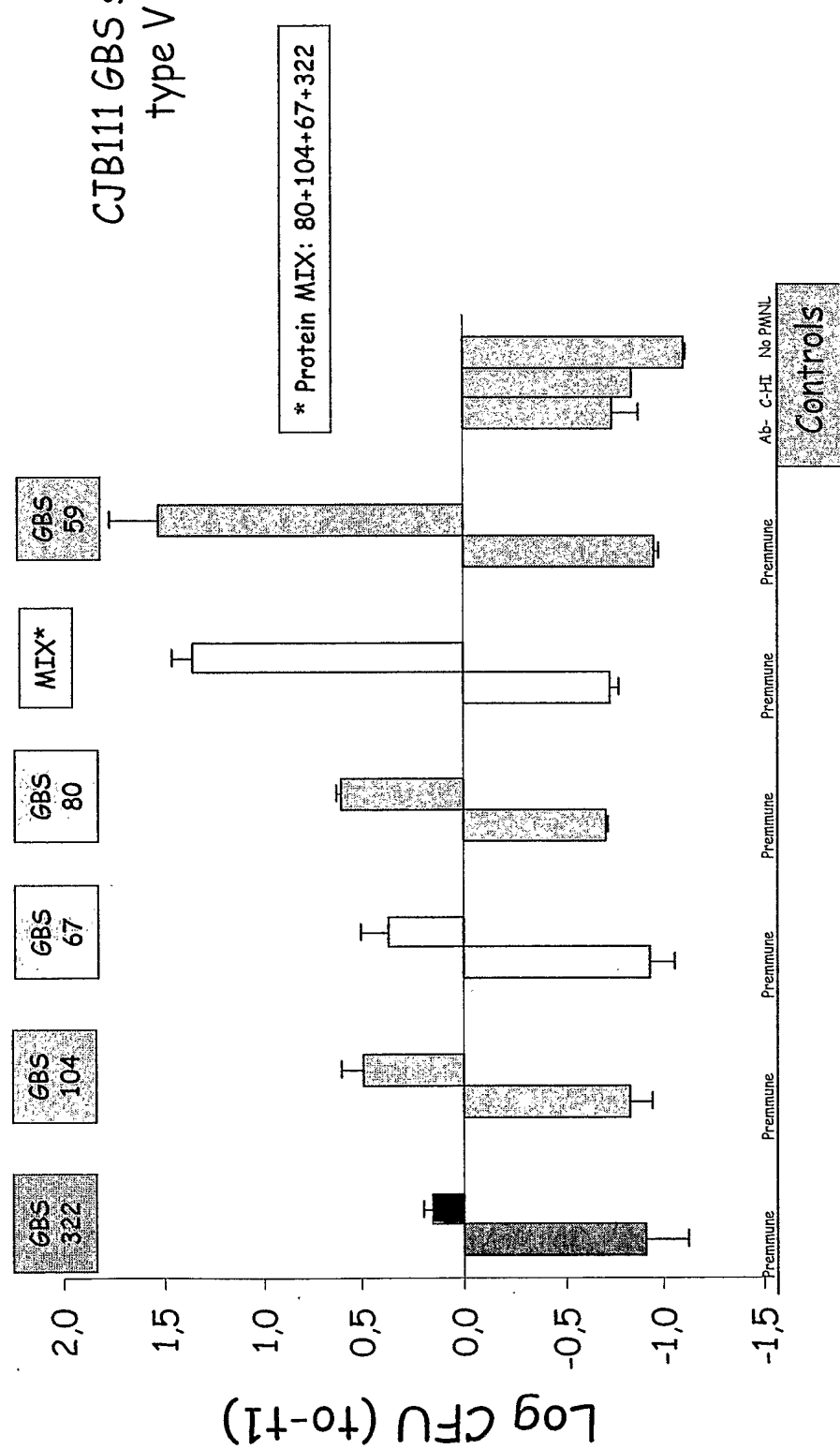


Figure 231

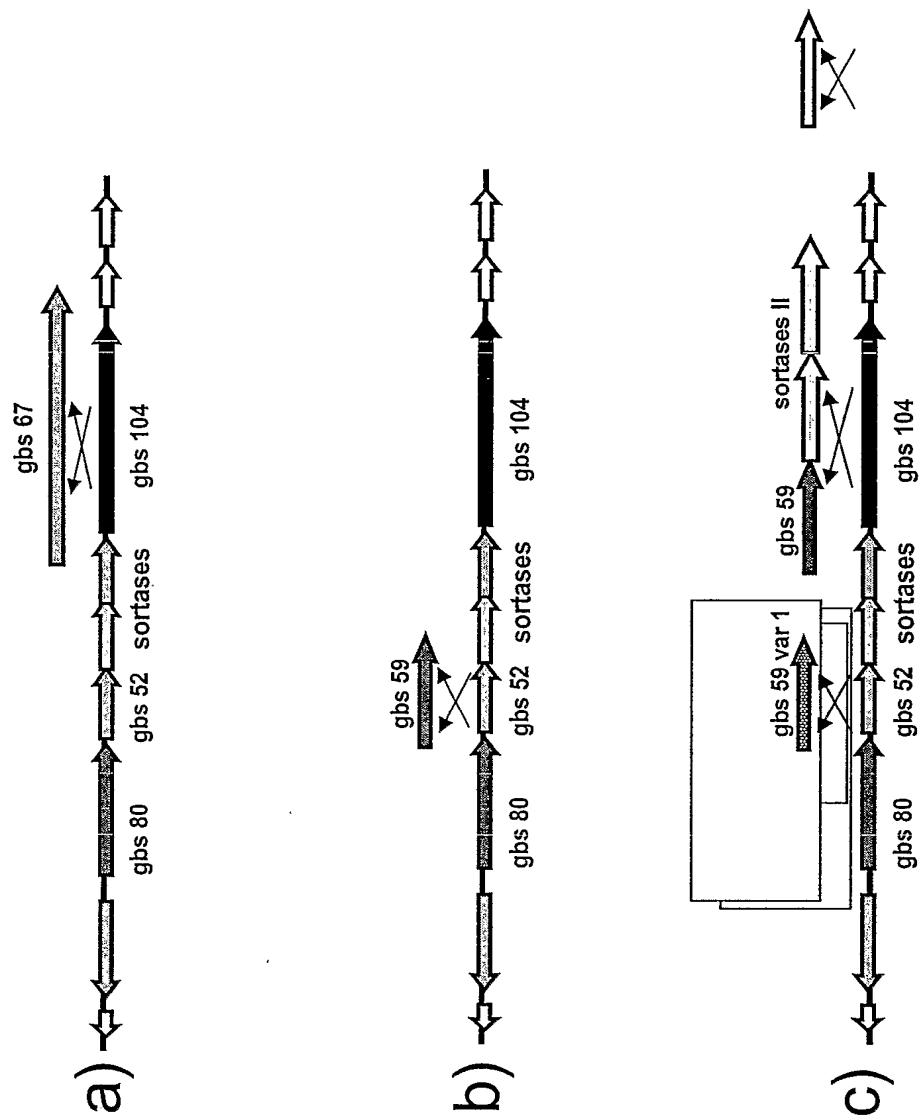
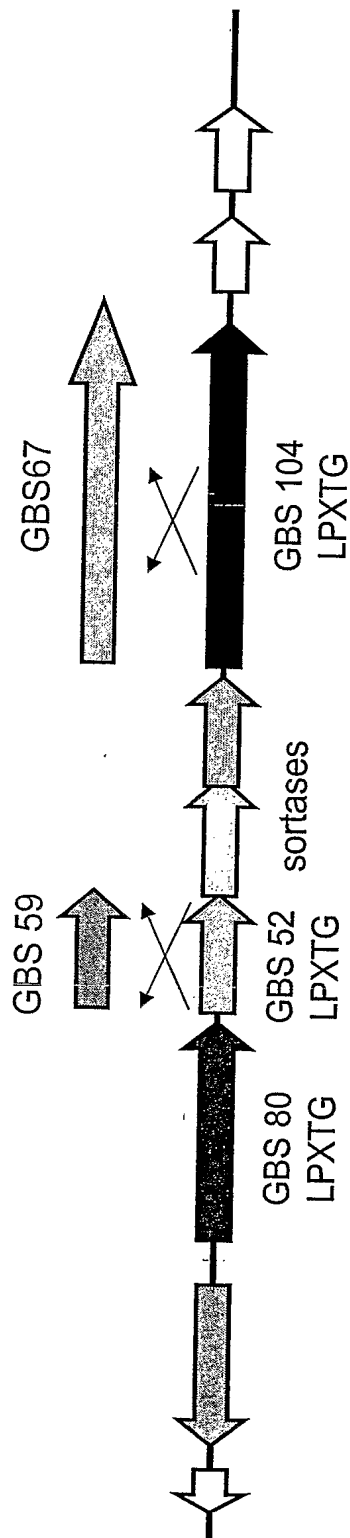


Figure 232



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Figure 233

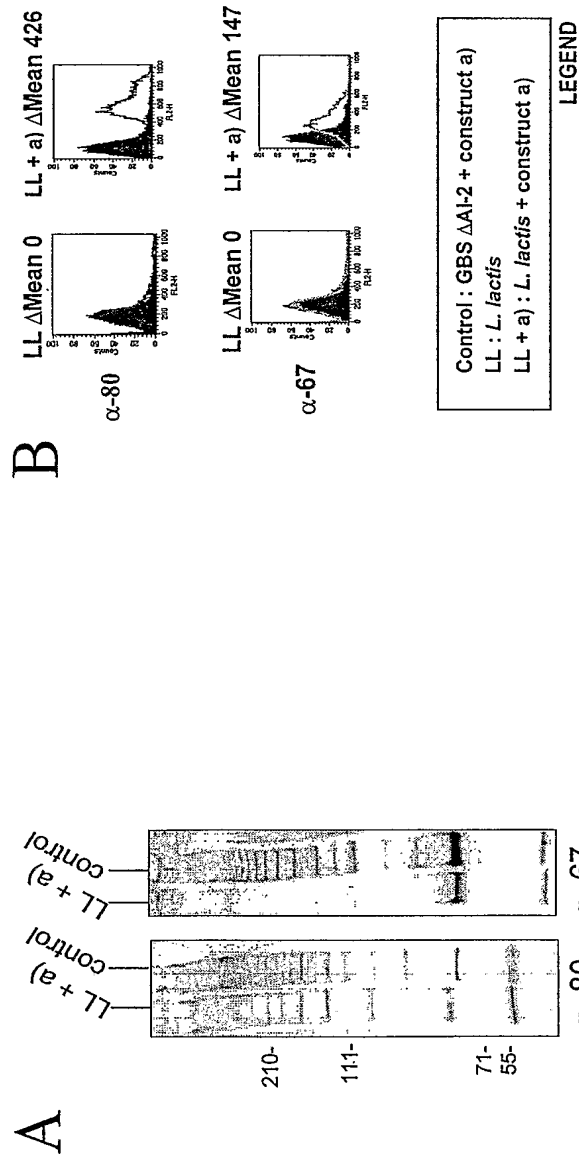
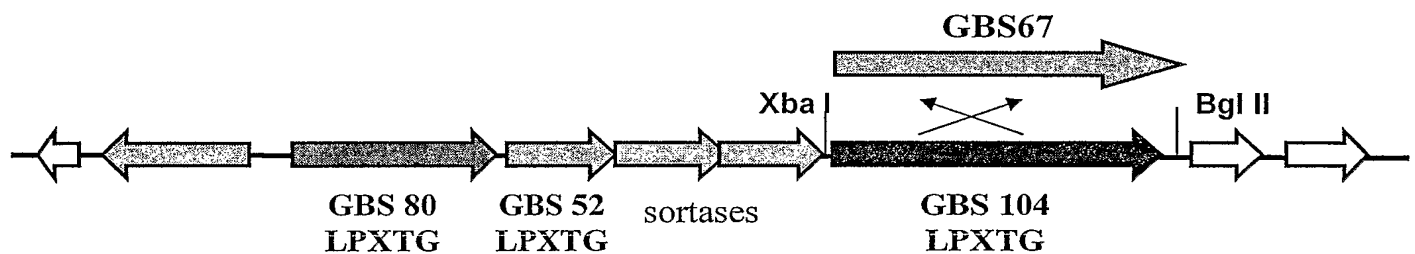


Figure 234 A

## Introducing Heterologous Antigens into AI-1 pilus to Obtain Protection Across GBS Strains

### 1- Substitution of GBS 104 with GBS67 from Island II

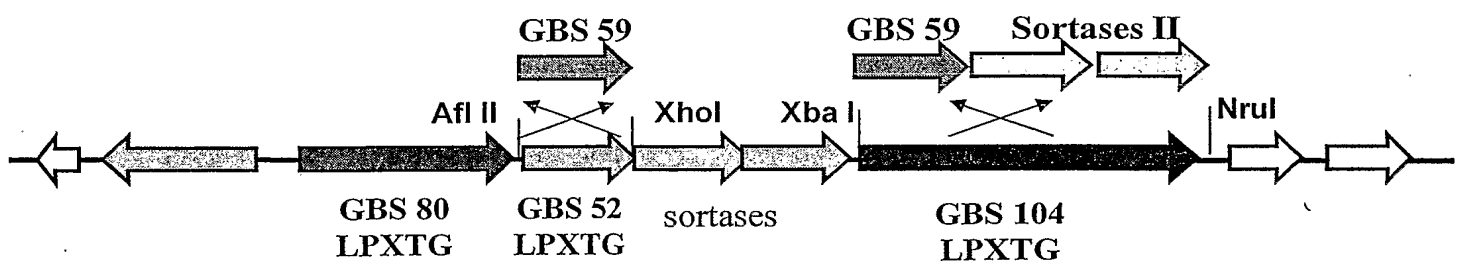


Oligo GBS67pAMXbafor AGTCAGTCTCTAGACGGCACAATAGGAGTTGTAAA

Oligo GBS67pAMBglrev CACCTGTCATAGATCTTAAGAATACTAAAGCGCATAA

### 2- Substitution of GBS52 or 104 with:

- GBS 59 alleles 515 or CJB
- GBS 59 allele CJB111 + sortases island II
- GBS 59 allele 515 + GBS 59 CJB111 + sortases island II



#### DETAILS:

a) Oligos to be used:

Oligo 59pAMAflfor1 AGTCAGTCCTTAAGCCGCATATTATTAATCATGTTG (allele 515)

Oligo 59pAMAflfor1 AGTCAGTCCTCGAGTTAACTTCCTCTGATTGACG (allele 515)

Oligo 59pAMAflfor2 AGTCAGTCCTTAAGAAGGAGTGGTGCTGCGGTAA (allele CJB111)

Oligo 59pAMXhorev2 AGTCAGTCCTCGAGTTAAGCTTCCTCTGATTGACG (allele CJB111)

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b) Oligos to be used:

**Oligo GBS59XbaF** CTAGTGATATATCTAGAGAAAAAG

**Oligo Sort59NruR** CTAGCTAGTCGCGACTTTTTCATTTTGGATTTCCCTTTC

## Figure 234 B

### 3- Substitution of GBS104 with a fusion of GBS322-GBS67 to include GBS 322 into AI-1

- a) Construct 1: GBS67 complete sequence included
- b) Construct 2: Only part of GBS 67 was included (*deleted bold region*)

#### DETAILS:

#### a) Construct 1:

##### Legend:

Pink GBS322

Black GBS67

**Black Bold:** fragment of GBS67 eliminated in construct 2

Green PK motifs

Yellow E motifs

Red LPXTC

> gbs67-515 + 322

```
MRKYQKFSKILTLSLFCLSQIPLNTNVLGESTVPENGAKGKLVVKKTDQNKPLSKATFV
LKTTAHPESKIEKVTAELTGEATFDNLIPGDYTLSEETAPEGYKKTNQTWQVKVESNGKT
TIQNSGDKNSTIGQNQEELDKQYPPTGIYEDTKESYKLEHVKGSPNGKSEAKAVNPYSS
EGEHIREIPEGTLKRISVGDLAHNKYKIELTVSGKTIVKPVDKQKPLETDTTWTARTVSEV
KADLVKQDNKSSYTVKYGDTLSEAMSIDMNVLAKINNIADINLIYPETTLTVTYDQKSHTA
ISMKIETPATNAAGOTTATVDLKTNOQSVADOKVSLNTISEGIMTPEAATTIVSPMKTYSSAF
ALKSKEVLAEQAVSQAAANEQVSPAPVKSITSEVPAAKEEVKPTQTSVSQSTTVSPASV
AETPAPVAKVAPVRTVAAPRVASVKVVTPIKVEGASPEHVSAPAVPVTTTSPATDSKLOAT
EVKSPVPAQKAPTATPVAQPASTTNAVAHPENAGLQPHVAAYKERVASTYGVNEESTYRAC
DPGDHGKGLAYDFIVGTNOALGNKVAQYSTQNMANNISYVWQQKEYSN
INSYGPANTWINAMPDRGGVTANNDHVFVSENKDWWFVLDNSMS
MNNDGPNFQRHNKAKKAAEALGTAVKDILGANSNDRVALVTYGSDFDGRSVDVVKGFKE
DDKYYGLQTKFTIQTENYSHKQLTNNAEEIIRIPTEAPKAKWGSTTNGLTPEQQKEYYL
SKVGETFTMKAFMEADDILSQVNRNSQKIIVHVTGVPTRSYAINNFKLGASYESQFEQM
KKNGYLNKSNFLITDKPDDIKNGESYFLPLDSYQTQIISGNLQKLHYLDLNLNPKGI
IYRNGPVKEHGTPTKLYINSLKQKNYDIFNFGIDISGFRQVYNEEYKKNQDGTGFKLKEE
```



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AFKLS DGEITELMRSFSSKPEYYTPIVTSADTSNNEILSKIQQQFETILTKENSIVNGTI  
EDPMGDKINLQLGNGQILQPSDYTLQGNDGSVMKDG IATGGPNNDGGILKGVKLEYIGNK  
LYVRGLNLGEGQKVTLTYDVKLDDSFISNKFYDTN GR TTL NPK SEDPNTLRDFPIPKIRD  
VREYPTITIKNEKKLGEIEFIKVDKDNKLLKLGATFELQEFNEDYKLYLPIKNNNSKV  
TGENGKISYKDLKDGKYQLIEAVSPEDYQKITNKPILTFEVVKGSIKNIIAVNKQISEYH  
EEGDKHLITNTHIPPKGI KICU KGILSFILIGGAMMSIAGGIYWKRYKKSSDMSIKK  
D

## Figure 234 C

## b) Construct 2:

&gt;gbs67-515 deleted+ 322

MRKYQKFSKILTLSLFCLSQIPLNTNVLGESTVPENGAKGKLVVKKTDQNKPLSKATFV  
 LKTTAHPESKIEKVTAELTGEATFDNLIPGDYTLSEETAPEGYKKTNQWQVKVESNGKT  
 TIQNSGDKNSTIGQNQEELDKQYPPTGIYEDTKESYKLEHVKGSPNGKSEAKAVNPYS  
 SEGEHIREIPEGTLKRISSEVGDLAHNKYKIELTVSGKTIVKPVDPKQKPLETDTTW  
 TARTVSEVKADLVKQDNKSSYTVKYGDTLSVISEAMSIDMNVLAKINNIADINLIYPETTLTV  
 TYDQKSHATATSMKIETPATNAAGQTTATVBLKTNQVSVADQKVSLENTISEGMTPEAATT  
 VSPMKTYSSAPALKSKEVLAQEQAVSQAAANEQVAPVKSITSEVPAAKEEVKPTQTS  
 VSOSTTVGPAVAAETPAPVAKMAPVRTVAAPRVASVKVYTPKVVETGASPEHVSAPAVE  
 VTTTSPATDSKLQATEVKSVPVAQKAPTATPVAOPASTTNAVAAHPENAGLOPHVAAAYK  
 EKVASTYGVNEFSTYRAGDPGDHCKGLAVDFMGTCNQAIGNKVAQYSTONMAANNISY  
 WQQKFYSNTNSIYGPANTWNAMPDRGGVTANHMDHVVSEFNKGESYFLPLDSYQQTQ  
 IISGNLQKLHYLDLNLNYPKGTIYRNGPVKEHGTPTKLYINSLKQKNYDIFNFGIDISGFRQ  
 VYNEEYKKNQDGTGFKLKEEAFKLSDEITELMRFSKPEYYTPIVTSADTSNNEILSKI  
 QQQFETILTKENSIVNGTIEDPMGDKINLQLGNGQILQPSDYTLQGNDGSVMKDGATGG  
 PNNDGGILKGVKLEYIGNKLYVRGLNLGEGQKVTLTYDVKLDDSFISNKFYDTNGRTTLN  
 PKSEDPNTLRDFPIPKIRDVREYPTITIKNEKKLGEIEFIKVDKDNKLLKLGATFELQEFNE  
 DYKLYLPIKNNNSKVVTGENGKISYKDLKDGKYQLIEAVSPEDYQKITNKPILTFEVVKG  
 IKNIIAVNKQISEYHEEGDKHLITNTHIPPKGIPKIGKILSFILIGGAMMSIAGGIYIWKRY  
 KKSSDMSIKKD

Oligos to be used:**Oligo GBS67pAMXbafor (vedi operone)**

AGTCAGTCTCTAGACGGCACAAATAGGAGTTGTAA

XbaI

**Oligo GBS67soe1rev**

GCAACGCGGATATGCTTTC TAACGGCTTTTGTGTCCACT

**Oligo GBS322soe2for**

GACAAACAAAAGCCGTTAATAACAGATACCAAGGTGGACAG

**Oligo GBS322soe2rev1 (per costruito non delete in 67)**

GAGTACGAAGACAACATCTTGTAAATGATACGTCGACG

**Oligo GBS322soe2rev2 (per costruito delete in 67)**

TAAAAAGTAACTCTCCCCCTTGTAAATGATACGTCGACG

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**Oligo fine67soe3for1 (per costruito non deleto in 67)**

GACGTATCATTAACAAAGATGTTGTCTTCGTACTCGAT

**Oligo fine67soe3for2 (per costruito non deleto in 67)**

GACGTATCATTAACAAAGGGGAGAGTTACTTTTTATTTC

**Oligo GBS67pAMBglrev (vedi operone)**

CACCTGTCATAGATCTTAAGAATAC TAAAGCCGCA TAA

BgIII

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**Figure 234 D**

PCR Soe1: GBS67pAMXbafor + GBS67soe1rev 727 bp

PCR Soe2 non del: GBS322soe2for + GBS322soe2rev1 1260 bp

PCR Soe2 del: GBS322soe2for + GBS322soe2rev2 1260 bp

PCR Soe3 non del: fine67soe3for1 + GBS67pAMBglrev 2061 bp

PCR Soe3 del: fine67soe3for2 + GBS67pAMBglrev 1419 bp

PCR Soe4 non del. PCR25: GBS67pAMXbafor + GBS67pAMBglrev 4000 bp

Substrato PCRSoe1, 2, 3 non del

PCR Soe4 del, PCR26: GBS67pAMXbafor + GBS67pAMBglrev 3312 bp

Substrato PCRSoe1, 2, 3 del

**4- Substitution of GBS 52 with a fusion of GBS322-GBS52 to include GBS 322 into AI-1**

(same legend as for GBS67 derivatives)

a) Construct 1: GBS52 complete sequence included

b) Construct 2: Only part of GBS 52 was included (*deleted bold region*)**DETAILS:**

a) Construct 1:

&gt;GBS322-52 senza delezione di 52 (B) PCR 24

MKMNKKVLLTSTMAASLLSVASVQAQETDTLWTARTVSEVKADLVKODNK  
 SSYTVKYGDILSVISEAMSIDMNVLAKEINNIADINLIYPETTLTVTYDQK  
 SHATSMKIETPATNAAGQTTATVDLKTNOVSVADQKVSINTISEGNTRE  
 WATTIVSPMKTYSSAPALKSKEVLAQEQAVSQAAANEQVSPA  
 RVKSIITSEVPAAKEELAKPTQTSYSQSTTVSPASVAAETPAPVAKVAPVRTVAAPRVAS  
 MKVVTPEKVTGASPEHVSAFAVPVTTTSPATDSKLOATEVKSVPAQKAF  
 IATPVAQPASTTNAAHPENAGLOPHVAAYKEKVASTYGVNEFSTYRAG  
 DPGDHGKGLAVDFIVGTNOALGNKVAQYSTQNMANNISYIMWQOKEYSN  
 INSIYGPANTWNAMPDRCCVTANHYDHVHVSFNK HQLTIVHLEARDIDRPNPQL  
 EIAPKEGTPIEGVL YQLYQLKSTEDGDLAHWNSLTITELKKQAQQVFEA  
 TTNQQGKATFNQLPDGIYYGLAVKAGEKNRNVSAFLVDLSEDKVIYPKII  
 WSTGELDLLVGVVDGDTKKPLAGVVFELYEKNRTPIRVKNGVHSQDIDA  
 AKHLETDSSGHIRISGLIHGDYVLKEIETQSGYQIGQAETAVTIEKSKTV

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TVTIENTKKVPTPKVPSRGGLEKQQAMALVIIGGILIALALRLLSKH  
RKHQNKD

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## Figure 234 E

## b) Construct 2:

&gt;GBS322-52 (A) PCR 23

MKMNNKKVLLTSTMAASLLSVASVQAQETDTTWTARTVSEVKADLVKQDNK  
 SSYTVKYGDTLSVISEAMSIDMNV LAKINNIADINLIYPETTLTVTYDOK  
 SHTATSMKIETPATNAAGOTTATVDLKTNOVSVADOKVSLNTISEGMTPE  
 ATTIVSPMKTYSSAPALKSKEVLAQEQAVSQAAAANEQVSPA  
 PVKSITSEVPAAKEEVKPTOTSVSOSTTVSPASVAAETPAVPVAKVAPVRTVAAPRVAS  
 VKVYTPKMETGASPEIIVSAPAVPVTTTSPATDSKLOATEVKSVPAQKAF  
 IATPVAQPASTITNAVAHPENAGLOPHVAAYKEKVASTYGVNEFSTYRAG  
 DPGDHGGKGLAVDFIVGTNQA LONKVAQYSTONMAANNISYVWQOKFYSN  
 NSLYGPANTWNAMPDRGGVTANHVDHVHVS ENK  
 QGKATFNQLPDGIYYGLAVKAGEKNRNVSAFLVDLSEDKVIYPKII  
 WSTGELDLLKVGVDGDTKKPLAGVVFELYEKNGRTPIRVKNGVHSQDIDA  
 AKHLETDSSGHIRISGLIHGDYVLKEIETQSGYQIGQAETAVTIEKSKTV  
 TVTIENKKVPTPKVPSRGGLEKICEQQAMALVIIGGILIALRLLSKH  
 RKHQNKD

Oligos to be used:

## Oligo 322Aflfor1

AGTCAGTCCTTAAGGATATTATAGTCTCGGACTA

Afl II

## Oligo 52 soe1 forA

CAAGGAAAGGCTACATTTAACG

## Oligo 52 soe1 forB

CATCAGTTGACGATTGTTTCATC

## Oligo52 soe1revA

AAATGTAGCCTTTCCTTGTTTGTTAAATGATACGTCGAACG

## Oligo52 soe1revB

AACAATCGTCAACTGATGTTTGTTAAATGATACGTCGAACG

## Oligo 52Xhorev

AAGACCTCCTCGAGATGGCACTT

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Xho I

PCR Soe1A: Oligo 322Aflfor1+ Oligo 52 soe1 revA 1370 bp

PCR Soe2A: Oligo52 soe1forA + Oligo 52Xhorev 520 bp

PCR Soe3A: Oligo 322Aflfor1 + Oligo 52Xhorev 1846 bp (con PCR Soe1A + PCR Soe2A)  
(PCR23)

PCR Soe1B: Oligo 322Aflfor1+ Oligo 52 soe1 revB 1370 bp

PCR Soe2B: Oligo52 soe2forB + Oligo 52Xhorev 742 bp

PCR Soe3B: Oligo 322Aflfor1 + Oligo 52Xhorev 2068 bp (con PCR Soe1B + PCR Soe2B)  
(PCR 24)

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Figure 235

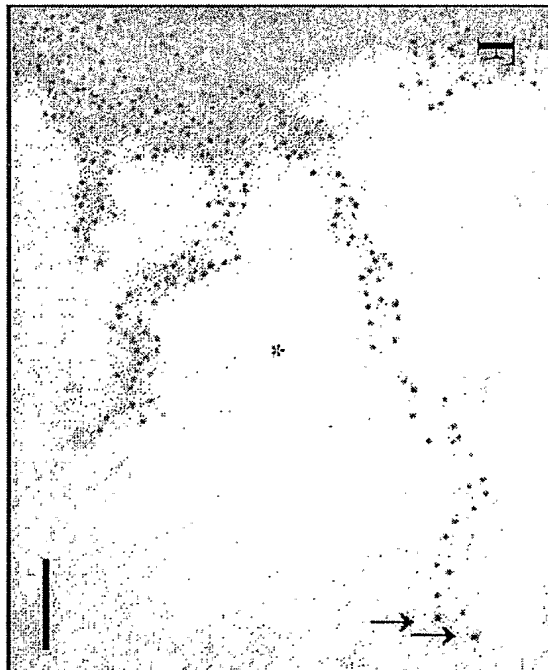


Figure 236





# Strain variability - GBS67: 2 alleles

1 MRKYQKPSKILITLSLFCISQIPLNTNVLGSEVPENGAKGLVVKTTDDQ 50  
1 .....NVLGESTVPENGAKGLVVKTTDDQ 25  
51 NKPLSKATFVLKTAHPESKIEKVTAELTGEATFDNLIPGDYTLSEETAP 100  
26 NKPLSKATFVLKTPSHSESKEVKVTEVTGEATFDNLTPGDYTLSEETAP 75  
101 EGYKKTQWQVKNVSGKTTIQNSGDKNSTIGNQBELDKQYPTGIYE 150  
76 EGYKKTQWQVKNVSGKTTIQNSDDKKSIIIEQREBELDKQYPLTGAYE 125  
151 DTKEYSKLEHVKGSPVNGKSEAKVNPYSSEGEHIREIPEGTLSKRISV 200  
126 DTKEYSNLEHVKNISPGKLEAKVNPYSSEGEHIREIQEGLTSKRISV 175  
201 GDLAHNKYKIELTVSGKTIKVPDKQKPLDVVFLDNSNSMNDGNPFR 250  
176 NDLDHNKYKIELTVSGKSIKTIKNDKDEPLDVVFLDNSNSMKNKN... 222  
251 HNKAKAAEALGTAVKDIILGANSNRVALVTYGSDFDGRSDVVKGFKE 300  
223 .NKAKKAGEAVENTIKDVLGANVENRAALVTYGSDFDGRVVKVKGFE 271  
301 DDKYGLQTKFTIQTENYSHKQLTNNABEILKRIPEAPKAKWGSTNGL 350  
272 .DPYYGLETSFTVQTDNDYSYKFTNTAADIIKKIPKEAPEAKWGTSIGL 320  
351 TPEQKRYLLSKVGEFTMKAFWEADDDILSQVNRNSQKLIHVHVDGVPT 400  
321 TPEKREYDLSKVGEFTMKAFWEADTILSSIQRSKRLIVHLTDGVPT 370  
401 SYAINNFKLGASVESFEQKKNNGYLNKSNFLIDKPEDIKNGESYFLF 450  
371 SYAINSFVKGSTVANOFEIKGKGLDKNNYFLTDDEPKIKNGESYFLF 420

451 PLDSYQTIISGNLQKLHYLDLNLNYPKGTIYRNGPVEHGHTPTKLYINS 500  
421 PLDSYQTIISGNLQKLHYLDLNLNYPKGTIYRNGPVEHGHTPTKLYINS 480  
501 LKQKNYDIFNFGIDISGRQVYNEEYKKNQDGTFOKLKEAFKLSDGEIT 550  
471 LKQKNYDIFNFGIDISGRQVYNEEYKKNQDGTFOKLKEAFKLSDGEIT 520  
551 ELMRSFSKPEYYTPIVTSADTSNNNEILSKIQQOFETILTKEINSVNGTI 600  
521 ELMRSFSKPEYYTPIVTSADTSNNNEILSKIQQOFETILTKEINSVNGTI 580  
601 EDPMGDKINLQNGQTLQPSDYTLQNGDGSVMKDGDIATGSPNNDGGILK 650  
571 EDPMGDKINLHNGQTLQPSDYTLQNGDGSIMKDSIATGSPNNDGGILK 620  
651 GVKLEYIGNKLYVRGLNGLGEGQKVTLYDVKLDSDSFISNKFYDTNGRTTL 700  
621 GVKLEYIKNKLYVRGLNGLGEGQKVTLYDVKLDSDSFISNKFYDTNGRTTL 670  
701 NPKSEDENTLRDFPIPKIRDVREYPTITIKNEKKGIEFTIKYDKONNKL 750  
671 NPKSEEDTLRDFPIPKIRDVREYPTITIKNEKKGIEFTIKYDKONNKL 720  
751 LLKGATFELQEFNEDYKLYLPIKNNNSKVVTGENGKISYKDLKDGKYQLI 800  
721 LLKGATFELQEFNEDYKLYLPIKNNNSKVVTGENGKISYKDLKDGKYQLI 770  
801 EAVSPEDYQKITNKPILTTEVVKSGSIKNIIVANKQISEYHEEGDKHLIN 850  
771 EAVSPDYQKITNKPILTTEVVKSGSIQNIIVANKQISEYHEEGDKHLIN 820  
851 THIPPKGIIIPMTGGKILSFILIGAMMSIAGGIYIWKRYKKSSDMSIKK 900  
821 THIPPKGI..... 828

Differences  
between strains  
2603 and H36B  
(AA not matching/AA  
total and % of homology)

114 / 828 (87,1%)

Figure 237

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# Strain variability - GBS67 Allele I (2603)

Strain	Differences in comparison with 2603 (% of homology)
2603	-
18RS21	1/833 (99.9%)
CJB111	14/833 (98.3%)
515	2/833(99.8%)

Figure 238

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# Strain variability - GBS67 Allele II (H36b)

Strain	Differences in comparison with H36b (% of homology)	FACS ( $\alpha$ -67 from 2603)
H36B	-	444
1169	10/823 (98.8%)	443
090	9/316 Stop codon (8G to 7G)	0
CJB110	11/824 (98.7%)	245

Figure 239

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(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SM, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

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(54) Title: IMMUNOGENIC COMPOSITIONS FOR GRAM POSITIVE BACTERIA SUCH AS STREPTOCOCCUS AGALACTIAE

(57) Abstract: The invention relates to the identification of a new adhesin islands within the genomes of several Group A and Group B Streptococcus serotypes and isolates. The adhesin islands are thought to encode surface proteins which are important in the bacteria's virulence. Thus, the adhesin island proteins of the invention may be used in immunogenic compositions for prophylactic or therapeutic immunization against GAS or GBS infection. For example, the invention may include an immunogenic composition comprising one or more of the discovered adhesin island proteins.

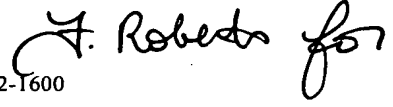


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# INTERNATIONAL SEARCH REPORT

International application No.

PCT/US05/27239

<b>A. CLASSIFICATION OF SUBJECT MATTER</b> IPC: <b>A61K 39/02( 2006.01)</b>  USPC: <b>424/190.1</b> According to International Patent Classification (IPC) or to both national classification and IPC		
<b>B. FIELDS SEARCHED</b> Minimum documentation searched (classification system followed by classification symbols) U.S. : 424/190.1  Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched  Electronic data base consulted during the international search (name of data base and, where practicable, search terms used) MEDLINE, BIOSIS, HCAPLUS, EMBASE, DERWENT, PUBLISHED APPLICATIONS AND ISSUED PATENTS.		
<b>C. DOCUMENTS CONSIDERED TO BE RELEVANT</b>		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 02/34771 A2 (TELFORD et al ) 02 May 2002 (02.05.2002), see pages 1411 and 3057. (only the relevant pages provided)	1-7 and 17-24
X	LARSSON et al. Protection against experimental infection with group B streptococcus by immunization with a bivalent protein vaccine. Vaccine. February 1999, Vol. 17, No. 5, pages 454-458.	1-7 and 17-24
<input type="checkbox"/> Further documents are listed in the continuation of Box C. <input type="checkbox"/> See patent family annex.		
* Special categories of cited documents:		
"A" document defining the general state of the art which is not considered to be of particular relevance "E" earlier application or patent published on or after the international filing date "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) "O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but later than the priority date claimed	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art "&" document member of the same patent family	
Date of the actual completion of the international search 21 May 2008 (21.05.2008)		Date of mailing of the international search report <b>25 AUG 2008</b>
Name and mailing address of the ISA/US Mail Stop PCT, Attn: ISA/US Commissioner for Patents P.O. Box 1450 Alexandria, Virginia 22313-1450 Facsimile No. (571) 273-3201		Authorized officer PADMA v. BASKAR Telephone No. 571-272-1600 

## INTERNATIONAL SEARCH REPORT

International application No.

PCT/US05/27239

### Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:  
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claims Nos.:  
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:
3. ☐ Claims Nos.:  
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

### Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:  
Please See Continuation Sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying additional fees, this Authority did not invite payment of any additional fees.
3. ☒ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.: 1-7 and 17-24
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

- Remark on Protest**
- ☐ The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.
- ☐ The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.
- ☐ No protest accompanied the payment of additional search fees.

## INTERNATIONAL SEARCH REPORT

International application No.  
PCT/US05/27239

### BOX III. OBSERVATIONS WHERE UNITY OF INVENTION IS LACKING

1. This application contains the following inventions or groups of inventions which are not so linked as to form a single general inventive concept under PCT Rule 13.1. In order for all inventions to be examined, the appropriate additional examination fees must be paid.

Group I, claim 1 -7 (in part) drawn to an immunogenic composition comprising a purified Group B Streptococcus adhesion island polypeptide.

Further species election to one composition comprising GBS AI -1 or GBS AI -2 required (see paragraph # 3).

Group II, claims 8-16 (in part) drawn to an immunogenic composition comprising a purified gram positive adhesion island polypeptide.

Further species election to one composition comprising one bacteria and one GAS AI -1 ,GAS AI -2,GAS AI -3 and GAS AI -4 required (see paragraph # 3).

Group III, claims 17-24 (in part) drawn to an immunogenic composition comprising a first and second purified Group B Streptococcus adhesion island polypeptide.

Further species election to one combination of first and second polypeptide (see paragraph # 3).

Group IV, claims 25-34 (in part) drawn to an immunogenic composition comprising a first and second gram positive GAS AI -adhesion island polypeptide.

Further species election to one combination of first and second polypeptide (see paragraph # 3).

Group V, claims 35-39 and 40 (in part) drawn to a modified gram positive bacterium and a method of manufacturing adhesion island antigen

Further species election to one modified gram positive bacterium required (see paragraph # 3).

Group I is directed to an immunogenic composition comprising polypeptide GBS AI -1 or GBS AI -2 whereas Group II is drawn to immunogenic composition comprising gram positive bacterial adhesion polypeptides GAS AI -1 , GAS AI -2 , GAS AI -3 and GAS AI -4 . These inventions are deemed to lack unity of invention because they are not so linked as to form a single general inventive concept under PCT Rule 13.1 because these two compositions do not share a common structure ,property and function as group I contains GBS polypeptide where as group II comprises GAS polypeptides . Group III and Group IV are also drawn to compositions as group III comprises combination of two polypeptides from GBS that shares no common structure ,property and function with Group IV as it comprises GAS polypeptide and thus do not share a single inventive concept. Thus these inventions are deemed to lack unity of invention because they are not so linked as to form a single general inventive concept under PCT Rule 13.1 Group V is drawn to a modified bacterium from GBS , GAS and non-pathogenic gram positive bacterium comprising expressing polypeptide GBS- AI -1or GBS-AI-2 and not share a single inventive concept from other four groups as the composition contains polypeptides which does not share a common structure, property and function.

## INTERNATIONAL SEARCH REPORT

International application No.

PCT/US05/27239

2. This application contains claims directed to more than one species of the generic invention. These species are deemed to lack unity of invention because they are not so linked as to form a single general inventive concept under PCT Rule 13.1. In order for more than one species to be examined, the appropriate additional examination fees must be paid. The species are as follows:

3 Group I species: GBS AI -1 80, 104, 52, 59, 67, 150, 01521, 01523, 01524 or GBS AI -2

Group II species: GAS AI -1, GAS AI -2, GAS AI -3 and GAS AI -4.

Group III species: Any combination of first and second polypeptide from GBS AI -1 80, 104, 52, 59, 67, 150, 01521, 01523, 01524, GBS AI -2.

Group IV species: Any combination of first and second polypeptide from GAS AI -1, GAS AI -2, GAS AI -3 and GAS AI -4

Group V species: Modified gram-positive bacterium or non pathogenic bacterium expressing GBS AI -1 80, 104, 52, 59, 67, 150, 01521, 01523, 01524, GBS AI -2, GAS AI -1, GAS AI -2, GAS AI -3 and GAS AI -4

The inventions listed as Groups 1-5 do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons:

The technical feature of linking groups appears to be that they are all related to immunogenic compositions comprising adhesion peptides methods of making adhesion peptide.

However, Beckmann et al Infection and Immunity, June 2002, p. 2869-2876, Vol. 70, No. 6 disclose an immunogenic composition comprising adhesion oligomeric polypeptide ( see page 2871, left column last paragraph through right column and figure 3) As this polypeptide binds to fibrinogen it is an adhesion immunogen. Therefore, the technical feature of linking groups 1-5 does not constitute a special technical feature as defined by PCT Rule 13.2, as it does not define a contribution over the prior art and hence unity of invention is lacking.

The special technical feature of Groups 1-5 is considered to be immunogenic compositions comprising polypeptides that share no common structure, property and function and thus do not share the same or a corresponding technical feature.

Accordingly, Groups 1-5 are not so linked by the same or a corresponding special technical feature as to form a single general inventive concept.

The claimed species GBS AI -1 80, 104, 52, 59, 67, 150, 01521, 01523, 01524, GBS AI -2; GAS AI -1, GAS AI -2, GAS AI -3 and GAS AI -4 have no common structure and thus are not linked by the same or a corresponding special technical feature so as to form a single general inventive concept under Rule 13.1. Hence, unity is lacking among species.